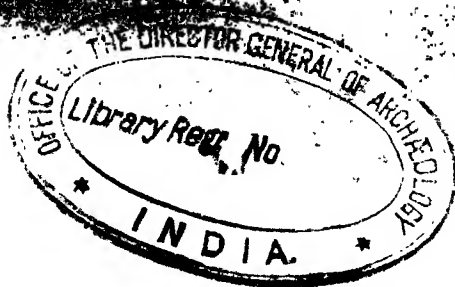


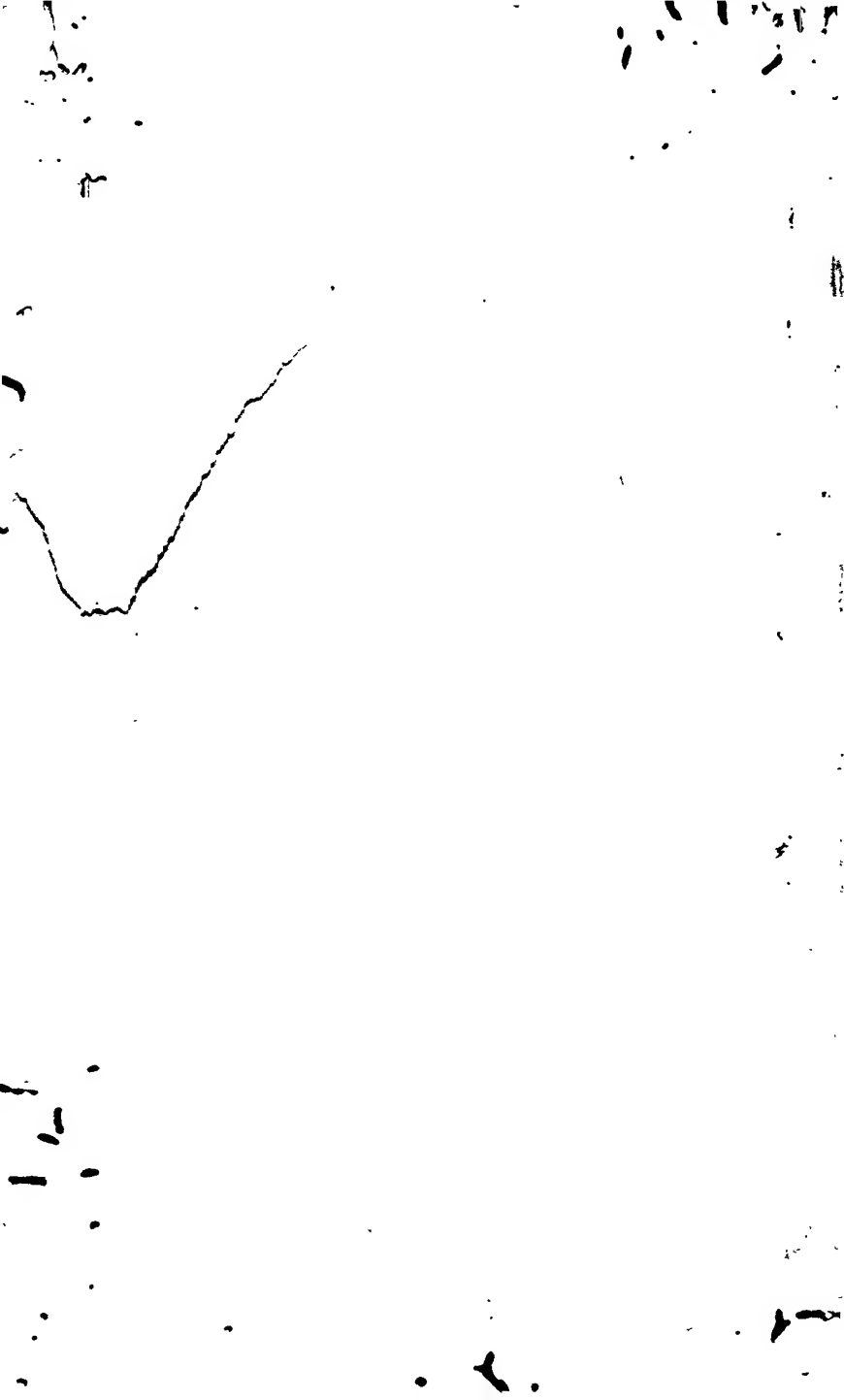
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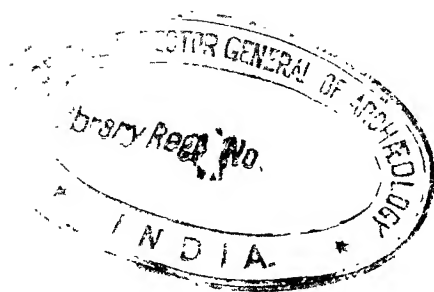
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THE JOURNAL

OF THE

ROYAL GEOGRAPHICAL SOCIETY

OF

LONDON.

VOLUME THE FIRST.

1831.

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ROYAL GEOGRAPHICAL SOCIETY.

AT a numerous Meeting of the Members of the *RALEIGH TRAVELLER'S CLUB*, and several other Gentlemen, held at the *Thatched House* on Monday, the 24th of May,

JOHN BARROW, Esq., in the Chair,

It was submitted that, among the numerous literary and scientific societies established in the British metropolis, one was still wanting to complete the circle of scientific institutions, whose sole object should be the promotion and diffusion of that most important and entertaining branch of knowledge, *GEOGRAPHY*.

That a new and useful Society might therefore be formed, under the name of *THE GEOGRAPHICAL SOCIETY OF LONDON*.

That the interest excited by this department of science is universally felt; that its advantages are of the first importance to mankind in general, and paramount to the welfare of a maritime nation like Great Britain, with its numerous and extensive foreign possessions.

That its decided utility in conferring just and distinct notions of the physical and political relations of our globe must be obvious to every one; and is the more enhanced by this species of knowledge being attainable without much difficulty, while at the same time it affords a copious source of rational amusement.

That although there is a vast store of geographical information existing in Great Britain, yet it is so scattered and dispersed, either in large books that are not generally accessible, or in the bureaux of the public departments, or in the possession of private individuals, as to be nearly unavailable to the public.

The objects, then, of such a Society as is now suggested would be,

1. To collect, register, and digest, and to print for the use of the Members, and the public at large, in a cheap form and at certain intervals, such new, interesting, and useful facts and discoveries as the Society may have in its possession, and may, from time to time, acquire.

2. To accumulate gradually a library of the best books on Geography—a selection of the best Voyages and Travels—a complete collection of Maps and Charts, from the earliest period of rude geographical delineations to the most improved of the

present time; as well as all such documents and materials as may convey the best information to persons intending to visit foreign countries; it being of the greatest utility to a traveller to be aware, previously to his setting out, of what has been already done, and what is still wanting, in the countries he may intend to visit.

3. To procure specimens of such instruments as experience has shown to be most useful, and best adapted to the compendious stock of a traveller, by consulting which, he may make himself familiar with their use.

4. To prepare brief instructions for such as are setting out on their travels; pointing out the parts most desirable to be visited; the best and most practicable means of proceeding thither; the researches most essential to make; phenomena to be observed; the subjects of natural history most desirable to be procured; and to obtain all such information as may tend to the extension of our geographical knowledge. And it is hoped that the Society may ultimately be enabled, from its funds, to render pecuniary assistance to such travellers as may require it, in order to facilitate the attainment of some particular object of research.

5. To correspond with similar societies that may be established in different parts of the world; with foreign individuals engaged in geographical pursuits, and with the most intelligent British residents in the various remote settlements of the Empire.

6. To open a communication with all those philosophical and literary societies with which Geography is connected; for as all are fellow-labourers in the different departments of the same vineyard, their united efforts cannot fail mutually to assist each other.

The Meeting then proceeded to nominate a Provisional Committee to consider and propose resolutions to be submitted to a General Meeting.

AT a Meeting of the GEOGRAPHICAL SOCIETY OF LONDON, held at the Rooms of the *Horticultural Society*, Regent Street, on Friday the 16th of July,

J. BARROW, Esq. in the Chair;

The following Resolutions were adopted.

1. THAT the Society, having been honoured with the gracious patronage and permission of His Majesty, be called 'THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.'

2. That the number of ordinary Members be not limited ; but that the number of Honorary Foreign Members be limited, as shall hereafter be determined.

3. That the Council of the Society consist of a President, four Vice-Presidents, a Treasurer, two Secretaries, and twenty-one other Members to conduct the affairs of the Society.

4. That the election of the said Council and Officers be annual.

5. That the office of President be not held by the same individual for a longer period than two consecutive years, but that he be eligible for re-election after the lapse of one year.

6. That one of the four Vice-Presidents go out annually ; he being eligible, however, for re-election after the lapse of one year : but the Treasurer and Secretaries may be annually re-elected.

7. That seven of the twenty-one other Members constituting the Council, go out annually, at the period of the General Election of the Officers of the Society.

8. That the Admission Fee of Members be 3*l.*, and the Annual Subscription 2*l.* ; or both may be compounded for by one payment of 30*l.*

9. That such part of the Funds of the Society as may not be required for current expenses, be placed in the public securities, and vested in the names of three Trustees, to be hereafter appointed by the President and Council.

The Chairman then addressed the following Observations to the Meeting, explanatory of the general Views of the Society.

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON being now established, the Provisional Committee cannot close its proceedings without adverting to the gratifying fact of there being enrolled, on the List of its Members, within so short a space of time, considerably more than Four Hundred names. From this great and increasing number, and still more from the general character of the Subscribers, it is fair to conclude that a favourable opinion has been formed of the utility likely to result from the labours of such a Society. The *degree* of utility, however, which will be really effected, the Committee deem it almost unnecessary to observe, must depend on the attention and assiduity which the President, the Vice-Presidents, and the Council may bestow on its concerns, quite as much as on the stock of knowledge they may bring to the consideration of the several subjects that will come before them. And not on the Council alone will depend the extent to which

the useful labours of the Society may thus be carried, but in a very great degree also on the assistance which they may receive from the many individuals eminent in the Arts, Sciences, and Literature, and from the distinguished Officers of the Army and Navy, whose names appear on the List of Members.

The many opportunities that are afforded to Officers of the Army while on Service abroad, and the promptitude and ability with which they avail themselves of them (as the Office of the Quarter-Master-General and the Board of Ordnance so amply testify), are the best pledges of what may reasonably be expected from that quarter; and the more so since the Committee has had the satisfaction to witness the readiness with which so many distinguished Officers of the Royal Artillery and Engineers have come forward to join the Society.

With the same confidence the Committee look for aid from the Officers of the Sister Service, who on their own peculiar element in particular, will, it is hoped, be assisted by other experienced Navigators, whether of and belonging to the Corporation of Trinity, the East-India Company, or to any other Maritime Service. On the exactitude of the minutest details of Hydrography must always depend the safety of Commerce and Navigation. Numerous dangers unquestionably exist in various parts of the ocean, that have not yet been ascertained, while others that have no existence still figure on our Charts, to the dread of Navigators. It has been well observed, that 'the man who points out, in the midst of the wide ocean, a single rock unknown before, is a benefactor of the human race;' and scarcely less so is he, who, after careful examination, is able to decide that a rock or shoal, which appears on a chart, is either misplaced, or has no existence.—These, it is true, may not be ranked among brilliant discoveries; but the smallest obstruction, whether rock or shoal, that exists in the ocean, may have been, and, so long as its exact position remains unascertained, is still likely to be, the cause of destruction to life and property. It may also be noticed that many practical observations are still desirable on the prevailing winds and currents, and more particularly on tides, of which there are various peculiarities among the islands and along the different coasts of the ocean, concerning which, facts and observations are still wanting, for establishing one general theory that shall be found applicable to every part of the Globe.

Every accession, therefore, to hydrographical knowledge,—a real danger discovered—a fictitious one demolished—or a peculiarity ascertained—must be of great importance to navigation, and a fit object for promulgation by the Society.

The Committee, however, are also willing to hope, that many

valuable contributions on geographical subjects will be received from other individuals, whether on the List of Members or not, than those who are thus professionally qualified and invited to furnish them; particularly from such of their countrymen as have permanent residences abroad, from the various public authorities in the British colonies, and from those who have travelled, or may yet travel, in foreign countries. It is not for the Committee to specify in detail the various points of information which should engage the attention of the traveller; but they may observe that every species of information, connected either with Physical Geography or Statistics, if it have only accuracy to recommend it, will be acceptable; and in cases where the stock of information, generally, in the hands of any individual, is not of sufficient magnitude or importance to form a volume for publication, if sent to the Society, it will be made available, in some form or other, in its Transactions. The routes, for example, which travellers may have pursued through portions of countries hitherto but imperfectly known, or inaccurately described,—the objects of Natural History that may have presented themselves,—the meteorological and magnetic phenomena that may have been observed—the nature of the soil and its products, of its forests, rivers, plains, mountains, and other general features of its surface; but above all, the latitudes and longitudes of particular places which the Resident or Traveller may have had the means of determining to a degree of precision on which he may rely;—such notices of detached portions of the Earth's surface, where regular surveys cannot be held, are of extreme importance, as furnishing the only means by which anything approaching to correctness in our general Maps can be attained. And the Committee cannot, therefore, entertain a doubt, that it will constitute a part of the Transactions of the Society to publish such detached pieces of information bearing on each of these points, as may be thought of sufficient interest and importance to be communicated for the use of its Members, and of the public at large.

But there are many other means, besides those now mentioned, by which geography may be advanced, which are too numerous to be here specified at length. In addition to the few, however, which have been noticed here, as well as in the printed prospectus already circulated, the following points may be briefly stated, as being among the most important that will probably engage the attention of the Society:—

1. The composition of Maps illustrative of particular branches of geographical knowledge, more especially those relating to orology, hydrology, and geology.

2. The establishment of new divisions of the Earth's surface,

formed upon philosophical principles, and adapted to different departments of science; more especially as regards those divisions which are founded on physical and geological characters, on climate, and on distinctions of the human race, or of language.

3. A more uniform and systematic orthography than has hitherto been observed, in regard to the names of cities and other objects; and a more precise and copious vocabulary, than we at present possess, of such objects.

4. The preparation and improvement of road-books for different countries, of gazetteers, of geographical and statistical tables, and all such matters as are of general utility.

The Committee cannot take upon itself to pronounce to which, of so many important considerations as have been enumerated, the attention of the Society should be *first* directed; the order of precedence must obviously in some measure, depend on the means, rather than the wishes, of the Council. But the Committee are willing to hope that, sooner or later, most or all of the subjects mentioned will engage that attention of the Members to which they appear to be fairly entitled; and that the range of investigation will in no respect be less comprehensive than the title of the Society implies.

In making these observations, which have reference chiefly to facts, the Committee wish, however, to guard themselves against any supposition that might be entertained, of their being hostile to theory; or of recommending to the Society to limit the reception of communications to such only as are the result of actual observation and experiment. On the contrary they are fully aware that great benefits have been, and may yet be, derived from speculative Geography. Theories that do not involve obvious absurdities or impossibilities, but are supported by reasonable probabilities, may serve as guides to conduct to important discoveries; by exciting curiosity they stimulate inquiry, and inquiry generally leads to truth. And reasonings and suggestions, therefore, in regard to parts of the world deserving of minuter investigation, which are little known, or of which no good account has yet been given, the routes to be observed in examining them, the chief subjects of inquiry, and best modes of overcoming the probable difficulties that may occur in the research,—all these will form proper subjects for admission into the proceedings of the Society.

And lastly, The Committee having reason to think that, at no great distance of time, the Society will be able to obtain suitable apartments for the reception of Books, Maps, Charts, and Instruments, they would venture to suggest, that donations of such materials as may tend to the elucidation and extension of Geographical Science, would afford

facilities to the attainment of its views; and they are willing to hope that, aided by such means, a Library of Books and Manuscripts on Geographical Subjects, with a collection of Charts and Maps, may be formed, that will not be undeserving of public approbation and patronage.

ROYAL GEOGRAPHICAL SOCIETY, 1831.

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Vice-Patron.

HIS ROYAL HIGHNESS THE DUKE OF SUSSEX.

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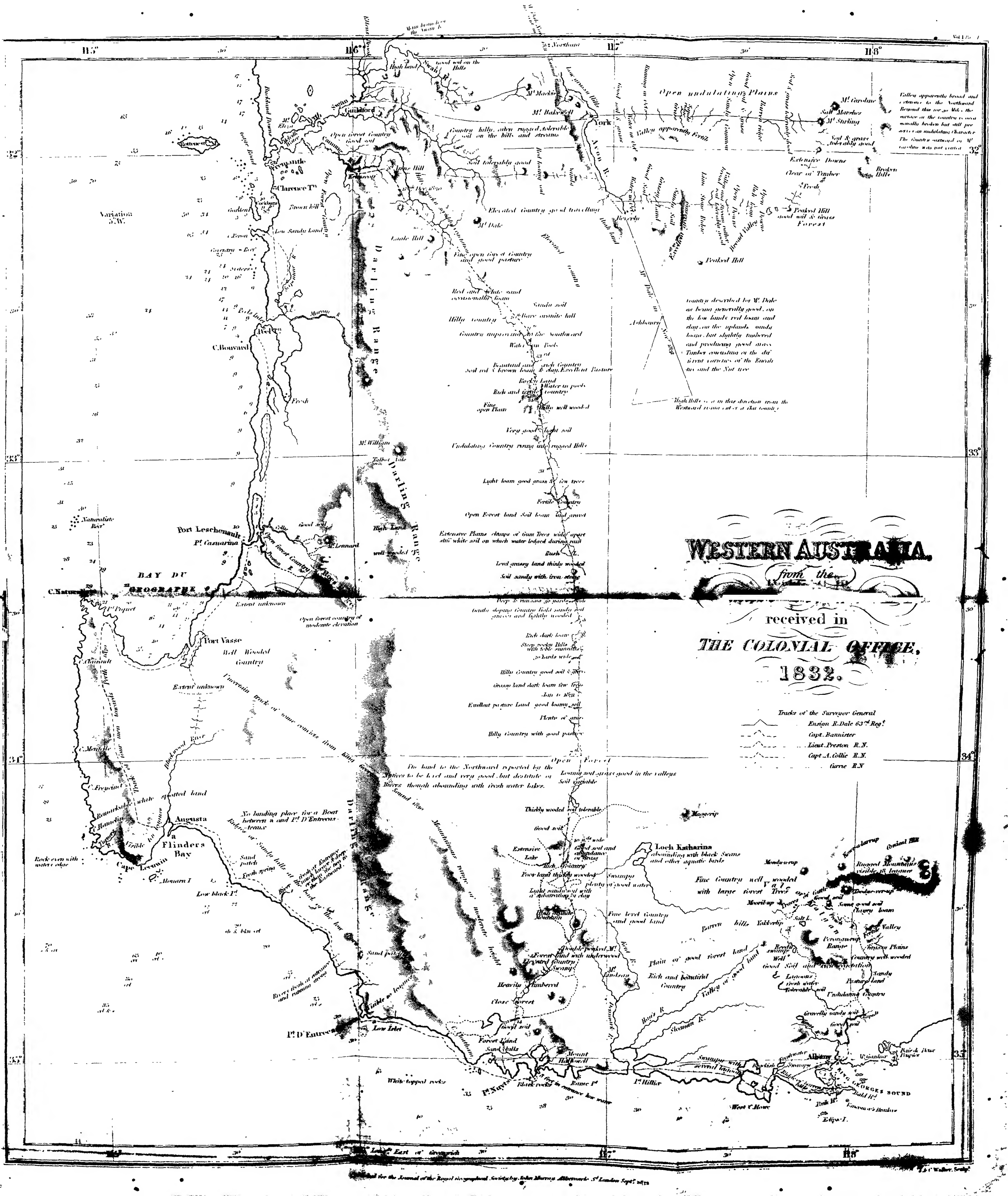
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WESTERN AUSTRALIA

received in
THE COLONIAL OFFICE.
1832.

- Tracks of the Survey General
- Ensign R. Dale 63rd Reg^t
 - Capt. Bannister
 - Lieut. Preston R.N.
 - Capt. A. Collier R.N.
 - Clarke R.N.



PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY.

I.—*State of the Colony of Swan River, 1st January, 1830.*
Chiefly extracted from Captain Stirling's Report. By John Barrow, Esq., F.R.S. Read 22d Nov., 1830.

IN the infancy of the Royal Geographical Society of London, and in this early stage of our proceedings, the Council may perhaps not be indisposed to receive such communications as may convey useful information, though not possessing that degree of minute accuracy which may be expected from the proceedings of the Society in its more mature state, when the higher objects for which it was instituted shall claim more marked attention, and when a more extended knowledge of its views shall have been diffused at home and abroad.

With this feeling I have been induced to submit to the Society a paper, drawn up from an authentic source, on the actual state of the Swan River Colony, at the commencement of the year 1830, about six months after its establishment. The subject may fairly be considered as not altogether unimportant at this moment, when so many conflicting statements and opinions have been promulgated, by which persons disposed to emigrate to that quarter are left in suspense as to the steps it may be advisable for them to take.

It would seem desirable, for other reasons, to collect and distribute information regarding New Holland, or as it is now more generally called, Australia. Hitherto, a country as large as Europe has been represented on our maps nearly as a blank. Yet, as this extensive territory will, in all probability, in process of time, support a numerous population, the progeny of Britons, and may be the means of spreading the English language, laws, and

institutions, over a great part of the Eastern Archipelago, it is presumed that every accession to our knowledge of its geographical features, however limited, will be acceptable to the Society.

Some strange opinions were at one time held regarding the formation of this extensive country. When the Blue Mountains behind Sydney were first passed, which was not till many years after the earliest establishment of the colony, and the waters there were found to take a westerly course, it was concluded that this new country—a recent creation according to some—had an inclination, or dip, on every side towards its centre, and that all the waters from the surrounding ridge fell, as from the rim of a basin, into a Mediterranean Sea, or a succession of swamps or marshes. And the loose surveys made of its coasts having afforded no discovery of any river of magnitude, tended to confirm this notion. Recent researches, however, and particularly those of Captain Sturt, have proved that, as in most other countries, the land dips from the central parts towards the coasts, and that the waters, as most waters do, drain off into the sea. On this subject I may quote a letter from Lieutenant-Colonel Dumaresq, Secretary to the Governor of New South Wales:—

‘It will not perhaps be uninteresting to you,’ says that officer, ‘to be informed, that, simultaneously with Captain Sturt’s discoveries, which have solved the problem respecting the construction of this Continent, it has been ascertained that the hypothesis, with regard to its post-diluvian formation, is as groundless as that of its absorbent interior marshes.

‘Some caverns in the neighbourhood of Wellington Valley have lately been examined, and found to contain innumerable specimens of fossil bones, deeply imbedded in stalagmite, or in indurated clay. I have seen some of these bones, which must have belonged to animals that do not now exist here, and are larger than those of the rhinoceros or buffalo. Teeth, apparently similar to those described by Buckland, have likewise been collected; and we have now many other proofs that this country was once inhabited by beasts of prey, and that it is coeval with the rest of the world.

‘The country in the neighbourhood of Wellington Valley is of limestone formation, and the ridges are perforated by numerous subterraneous caverns, which branch off in various directions. Others exist in the Shoal Haven gullies, (the most remarkably-formed country, perhaps, in the world,) and which will probably be found to contain similar diluvian remains.

‘To the above physiological facts I may add, that Captain Sturt does not appear to think it at all improbable that there is

‘ an opening from “ Lake Alexandria ” into the Gulf of St. Vincent ; and he is of opinion that the whole of that country is formed by alluvial deposit from the vast interior, through which flow the rivers Murray, Darling, Castlereagh, and Peel ; as also that the Darling will be found to be one of the longest rivers of the world.

‘ We have recently ascertained that the finest tract of land exists to the south, immediately beyond our present boundary, which is abundantly watered by streams said to take their rise from snow-clad mountains. These facts induce me to think we should abandon the idea of pushing our settlements, at present, farther into the interior, and that we ought to form a belt of colonization along the north and south coasts. The water communication would give employment to seamen, and be the means of converting the Colonial youth into sailors, who, in case of need, might contribute to the manning of the navies of the mother country.’

Thus far Colonel Dumaresq. With regard to the discovery of bones, Major Mitchell, the Surveyor-General in New South Wales, thus writes to Mr. Hay :—‘ At length an immense quantity of the remains of antediluvian animals has been discovered, precisely in a situation such as that described by Professor Buckland. What is most singular is, that there appears no affinity, as far as I can discover, between these bones and those of the caves of Europe, although some are very large. A bone, the *ulna* of some huge animal, is somewhat like that of an ox, but it is four times as large.’

Colonel Dumaresq’s observation, that the finest tracts of land are found towards the south coast of this great continent, is fully confirmed, as to the western part of the same south coast, by the discoveries made by Dr. Wilson of the navy, to the distance of eighty or ninety miles northerly, from King George’s Sound, recently annexed to the settlement of Swan River. Of this journey a brief account is contained in the following paper, and it is also sketched on the map. Our acquaintance, however, is yet far from being minute with this south coast, from Cape Leuwin to Port Philip,—an extent of at least fifteen hundred geographical miles,—otherwise an estuary of sixty miles in length, by thirty or forty in breadth, could not have escaped observation until discovered from the interior ; and our knowledge of other parts of the coast is even still more defective. For instance, on the western side, from North-west Cape, in lat. 22° , to Clarence Strait, in lat. $12\frac{1}{2}^{\circ}$, a distance of more than one thousand miles, there are numerous large openings, not yet examined, in which no land is visible to the eye of the spectator in the interior, and through

which rivers of the first magnitude might discharge their waters unseen and unknown. The whole of this coast is fronted with innumerable islands, with deep channels between them, through which, according to Captain King's expression, 'the tide rushes with frightful rapidity.' He suspects the great mass of land called Dampier's Land, extending from Cape Levique to Pointe Gantheaume, to be an island, behind which there is an opening of at least eight miles in width; and here, as well as in the Buccaneers' Archipelago, he found the rise and fall of the tides six and thirty feet, which on other parts of the coast did not exceed eight or nine feet. From these phenomena Captain King comes to the same conclusion with that excellent old navigator Dampier. 'From all that is at present known,' he observes, 'of this remarkable opening, there is enough to excite the greatest interest; since, from the extent of the opening, the rapidity of the stream, and the great rise and fall of the tides, there must be a very extensive gulf or opening, totally different from everything that has been before seen.' But in parts of the coast so dangerous, no survey can be made, except in boats, or by land, along the shore.

* * * * *

'It will not be necessary for me,' says Captain Stirling, in his official despatches to Government, 'to recapitulate the inconveniences we had to encounter on our first arrival. The winter season, the loneliness of our situation, and ignorance of the country, and of the navigation of the coast, and our anxiety as to whether we should succeed or fail, were sources of uneasiness which are happily passed away. It is our present condition that will interest you most, and to that I shall confine myself.'

The first operation on arriving at Swan River, was to mark out the site of two towns, to one of which was given the name of Freemantle, close to the entrance of the river; to the other that of Perth, about nine miles higher up, on its right or northern bank. In August, 1829, the settlers began to crowd in; and having received their respective allotments, commenced the erection of temporary buildings. In November, the country on the banks of the Swan and Canning Rivers, extending between the sea and the mountains, and to the distance of fifty miles to the southward of Perth, was thrown open to them. And many at once established themselves on their lands, regardless of any danger from the natives, who indeed were found to be so harmless, that single individuals even, who had traversed the country, and particularly among the mountains, had never met with any interruption, nor sustained any insult or injury at their hands.

As settlers continued to flock in, towards the end of the year

Captain Stirling found it necessary to explore the country to a greater extent than had hitherto been done, by which he obtained a knowledge relative to the coast seventy miles to the northward of Rottenest, and ninety miles to the southward of it. In this extent, the only discoveries of any note were six rivers, of no great magnitude, and a bar harbour, capable only of receiving boats. To the northward, the land seen was of indifferent quality, while that to the southward was found to improve in fertility, the further it was explored in that direction. One of the settlers was so much struck with the fertility of the soil about Port Leschenault, that he determined at once to fix his abode there. He describes this estuary to exceed that of Melville Water in the Swan River, in point of size, and superior in the beauty of its banks. It receives two rivers flowing down from the Darling range, which is here about the same distance from the coast as at Swan River. Across the mouth of the Colley is a bar, but to the distance of sixteen or eighteen miles within it maintains a depth of water from six to two fathoms, and here it becomes perfectly fresh. The plains are well wooded with large timber trees, and the whole country wears the appearance of an English park. Port Leschenault is fit only for the reception of small craft, having a bar, with no more than from three to four feet, and two fathoms water within.

The nature of the soil in the extent of country here mentioned is of various descriptions. On the sea-coast, where a continued calcareous ridge exists, no gramineous plants are to be found, but several species of shrubby or herbaceous plants rise out of the sandy surface, affording good nutriment for sheep and cattle at all seasons of the year. Next to this calcareous formation is a parallel breadth of a superficial soil, still somewhat sandy, bearing large timber trees, and affording good but rather scanty feeding for sheep and cattle. Adjoining this district of light, sandy soil, is a considerable breadth of red land, extending to the base of the Darling mountains, the soil of which varies from red sandy loam to the richest red marl and clay, apparently fit for all agricultural purposes. The fourth variety of country is the uneven surface of the mountainous range, which is of granite and trap formation. The valleys of this range are exceedingly rich and verdant, and the hills themselves, although occasionally rugged by the protrusion of the rocks, afford magnificent timber, and very excellent sheep lands. The whole breadth of this range of mountains had not been crossed*, though examined to the distance of twenty-five miles from the western edge. Straggling parties of natives were occasionally met with; and in one or two places were hovels of

* *ce*, however, on this head p. 16, where subsequent discoveries are noticed

grass and twigs, very small, and resembling in shape the half of a bee-hive cut vertically. The men and children were naked : their women did not appear. They seemed to be a good-humoured, inoffensive people. In several of the valleys are pools and rills of water. The fifth and last variety of soil is that which is found on the banks of the rivers and streamlets. It is alluvial, and generally very rich, bearing spontaneously good native flax, many edible roots, and thirty or forty species of grasses. This description of the country applies more particularly to the extent of about forty miles to the southward of Swan River. Further south, the sandy tract disappears, and the rocky ground is less protruding; the climate is cooler, and the surface seems to indicate the fall of more frequent showers.

From the little inconvenience which a large portion of the settlers suffered from want of dwellings, and exposure to the night air for weeks together, the opinion is universal that the climate is favourable to health in a very uncommon degree. Captain Stirling says, that for two or three of the summer months it was deemed prudent that the workmen should not work exposed to the sun between the hours of ten and three; but that great exertion at other times produced no consequent lassitude: and he adds that, with the exception of ten or eleven days, the summer heat had been tempered by southern breezes, and thereby rendered very agreeable. Rain had not fallen for about three months; but this drought fortunately occurs at the season proper for harvest. And though the grasses and other herbage are at this time much injured by the great and glowing heat of the sun, it is worthy of remark, that on sandy soils the plants sustain the heat much better than on the clay. None of those whose roots are near the surface can escape from the effects of the baking which this latter kind of soil sustains.

Captain Stirling speaks with great caution on the productive power of the soils, and how far they may be modified by climate. 'The most skilful of the farmers who have come from England,' he observes, 'profess themselves at a loss to form a judgment here, as processes in vegetation are going forward before their eyes, even on mere sands, which are wholly irreconcilable to their pre-existing notions and modes of judging. I think, however,' he continues, 'I am safe in stating that the sandy soils on the coast produce a shrubby herbage, on which horned cattle, horses, and sheep have lived now throughout the hottest and the coldest parts of the year; that there is, between the hills and the sea, a breadth of red loamy soil, on which grain and artificial grasses may be produced; that the banks of the rivers and numerous streams offer the richest alluvial loam; and that the hills themselves, although occasionally very rugged, are capable of

‘ becoming good sheep pasture, as the soil on their sides, where ‘ it exists at all, is invariably excellent, resting on granite and ‘ whinstone.’ He states that the supply of water for the use of the people and for cattle is abundant everywhere. Though the rivers are not of great magnitude, they are of value, by serving as so many canals for boat navigation. Lakes, streams, and springs are found in every direction; and even on the sea-shore wells have been rarely sunk in vain. From this abundance, and from the considerable provision of food for live stock which the territory seems to possess, he thinks the pastoral life will be found more profitable than the agricultural, and will be chosen by the bulk of the settlers.

It is too early yet to form any estimate as to the number of cattle, horses, and sheep which may be kept on an average of any given extent of land; but that very considerable numbers may be sustained is evident from the fact, that, at the very driest season of the year, when no rain had fallen for three months, there were both food and water in abundance. This is an important fact, as the power of supporting these animals without artificial food will secure not only a clear profit to their owners, but a supply hereafter of animal food for the use of the settlement. The live stock which has been introduced is described as being, in several instances, of the very best quality, and, with very few exceptions, arising chiefly from neglect, all kinds of it have done well. The bullocks and sheep, even in the dry season, fatten upon the natural grasses and herbage. Horses from England have not prospered so well, but even these have maintained themselves without any food beyond the natural herbage. In short, he observes, ‘ I am happy ‘ to say, with reference to grazing, that there is every reason to be ‘ satisfied with the result of our experience up to the present time.’

The views of those settlers who look forward to tillage are as yet confined to gardening and farming for their own consumption. Grain is not likely to be cultivated to any great extent, as it can be imported from Java and the surrounding colonies of New South Wales and Van Dieman’s Land at a cheaper rate than it can be produced in the new settlement, at least for some time to come. Captain Stirling thinks, however, that flax of a very superior kind, and a species of hemp, both growing spontaneously, may probably be cultivated to advantage; that timber, which is abundant, may find a profitable market; that wines, olives, figs, opium, and tobacco, may be looked to as future sources of export; but that these and other articles must await the time when the present subsistence and comfort of the settlers shall have been provided for, and a stock of the necessities of life permanently secured.

Many of the settlers of Perth and Fremantle have employed

themselves in the construction of boats for the conveyance of their goods on the rivers. The number of these in the settlement were not less than forty. Some of the settlers employ themselves profitably in fishing; and Captain Stirling has reason to believe that the settlement will be able speedily to export cured fish to Java. Whales are abundant on the coast, and attention has been drawn to the establishment of a whale-fishery, that can hardly fail of success. Cockburn Sound is a safe and extensive anchorage: it has been made easy of access now by buoying off the channel leading into it; and no place could be better situated for a marine establishment than the eastern shore of Buache or Garden Island, where careening wharfs may be constructed at a trifling expense.

The favourable position which this part of the coast of New Holland occupies, with reference to the trade of the Eastern seas, Captain Stirling observes, has been shown in some measure by the arrival of ships from various parts of the world, to the number of more than thirty, in the seven months of the first year of the establishment of the colony. Some of those from England landed all their cargoes there; but the greater part merely called, and after landing passengers and part of their cargoes, proceeded on their routes. Two vessels had been sent to the Malay islands; and Captain Stirling understood that four small vessels were intended to be employed in that and other lines of trade, diverging from Swan River as a centre. By means of these, it will soon be determined whether this position will prove favourable for the disposal of British manufactures among the easternmost of the Malay islands.

In the formation of all new colonies, there will necessarily be found a large portion of the early adventurers giving vent to feelings of discontent and disappointment. It always happens that many of such adventurers are men unsettled in their views, inordinate in their expectations, and wholly unfitted to encounter the difficulties which are inevitable in the infancy of a colony; and that such persons should be disappointed, discontented, and their ruin completed, is quite in the nature of things. Accordingly, among the numerous settlers who have flocked to Swan River were not a few whose minds and bodies were but ill-suited to encounter the struggles and distresses which are the unavoidable concomitants of a new settlement. ‘Many, if not all,’ says Captain Stirling, ‘have accordingly been more or less disappointed on their arrival, either with the state of things here, or their own want of energy to surmount the difficulties pressing around them—not greater, however, than such as must necessarily be experienced in the beginning of every new colony;’ and it may be added, far less severe than those which the American colonists had to encounter, or those who first established

themselves on the opposite side of Australia. Captain Stirling, however, observes, that ‘from this state of depression the active and stout-hearted have now recovered; and ten or twelve of the leading men having occupied their lands, and having declared themselves fully satisfied with the quality of the soil and the condition of their cattle, I consider the undertaking to be now safe from the effects of a general despondency, which at one time threatened to defeat the views of his Majesty’s government in this quarter.’

Among the heads of families there is a great majority of highly respectable and independent persons; in the working class a great variety. Some masters have been careful in the selection of their servants and workmen; but the greater part have either engaged the outcasts of parishes, or have brought out men without reference to character—men who, incapable of succeeding at home, are not likely to prosper in a new settlement to the extent of their groundless and inconsiderate expectations. ‘If it be possible,’ says Captain Stirling, ‘to discourage one set of people and to encourage another, I would earnestly request that, for a few years, the helpless and inefficient may be kept from the settlement, whilst to the active, industrious, and intelligent, there may be a confident assurance of a fair reward for their labours.’

The state of the colony, abstracted from the official returns, at the end of the year 1829, and of six months from the first arrivals, was as follows:—

Number of residents, 850. Non-residents, 440. Value of property giving claim to grants of land, 41,550*l*. Lands actually allotted, 525,000 acres. Locations actually effected, 39. Number of cattle, 204; of horses, 57; of sheep, 1096; of hogs, 106. Number of ships arrived between June and December, 25.

Though, strictly speaking, there is no harbour at or near Swan River, this deficiency is, to a certain degree, compensated by the capacious anchorage in Cockburn Sound, capable, as Captain Stirling informs us, of containing in safety a thousand ships. By the entrance being buoyed off, it is rendered of easy access for large ships; but being strewn over with rocks, it becomes wholly impracticable when the buoys are removed. Any number of vessels would lie in perfect safety in this large sound from an enemy’s squadron on the outside, as the middle part of it is out of mortar range, either from the sea or the land side. Such a port, situated as this is, in the hands of an enemy, might become, in any future war, ten times more destructive to British trade than even the Isle of France was in the last.

No other port or harbour exists on this line of coast, with the exception of Port Leschenault, accessible only, as has been observed, to boats. The great Baie Geographe, whose shape and

position, with regard to the points of the compass, is precisely that of the Table Bay of the Cape of Good Hope, has safe anchorage only when the winds are to the eastward, southward, and south-west. But on the southern coast of Australia, about one hundred and fifty miles to the eastward of Cape Leuwin, is the safe and excellent roadstead of King George's Sound, with which are connected two harbours, sheltered from all winds, and completely land-locked—Princess Royal Harbour to the north-east, and Oyster Harbour to the north-west; the former having an entrance and anchorage within for the largest ships; but the entrance of the latter has not more than fourteen or fifteen feet at high water. Plenty of wood and good water are to be had in either of the harbours, and also in the sound. The position, close to the tracts of all ships proceeding to New South Wales, and the inviting conveniences of these two harbours, induced the government, some few years ago, to take possession of them, and to establish a small military post there, under the direction of General Darling. It has now, however, very properly been placed under the authority of Captain Stirling, as a part of the Swan River colony, and will probably become, at no great distance of time, the head-quarters of the settlement. Dr. Wilson, of the navy, an intelligent and enterprising traveller, who has visited every part of Australia, from Raffles Bay in the north to King George's Sound in the south, has given some account of the country contiguous to the latter. In company with one or two others, and a civilized and intelligent native belonging to the post, he travelled about eighty miles in the interior to the northward, and returned by a more westerly course, traversing in the whole about two hundred miles over a country hitherto unexplored. Each of the party being obliged to carry his own blanket, provisions, and water, (the latter, however, being found unnecessary,) the excursion occupied eleven days; but such is the excellence of the climate of this country at all seasons of the year, but more especially agreeable in the summer months, that they felt no inconvenience by sleeping on the ground in the open air, nor did they suffer any privation worthy of notice. Dr. Wilson being furnished with no other instrument than a compass, the points marked down in the sketch of a chart which accompanies this notice, are the result only of the bearings and estimated distances traversed, and must therefore be considered only as conveying a very general description of the nature of the surface travelled over.

It will be evident, from the inspection of this sketch, and still more so from the journal out of which this notice is extracted, that, although in the immediate neighbourhood of King George's Sound the surface is sandy and wears an unpromising appearance, yet in the interior there is no want of good grassy plains, large

forest-trees, rivers, lakes, and ponds of good fresh water, in almost every part of the country traversed by Dr. Wilson. He says, indeed, 'that the country is so well supplied with water, that 'those of his party who wished it enjoyed the luxury of a cold 'bath, at least once a day, one only excepted.' The surface travelled over consisted chiefly of fine plains and rich valleys, alternating with ridges clothed with shrubby plants, a great proportion of the former being capable of tillage, and the rest affording good pasturage for sheep and cattle. On the ranges of the loftier hills were clumps of forest-trees of large dimensions. On the most barren lands were various species of *Banksia*, stunted swamp oak, the grass-tree, and other plants similar to those on the same kind of soil in New South Wales. On the alluvial flats along the banks of the rivers and streamlets, the vegetation was most luxuriant. In the glens of the mountains, the blue gum, the turpentine, the box, and the apple-trees predominated, many of them measuring from twenty to thirty feet in girth, and from fifty to sixty of trunk, free from branches. The prevailing genus here, as in most parts of New South Wales, is the *Eucalyptus*, of which but few of the species afford useful timber. The green wattle was but occasionally observed: it flourished most luxuriantly on the hills in the neighbourhood of Mount Lindsey. This mountain is described as a peak rising out of a ridge to the height of five or six thousand feet, terminated in a square of about thirty yards each side, perfectly level, paved with minute particles of quartz, and having at each angle an immense block of granite. The extensive view from this mountain gave Dr. Wilson an excellent opportunity of crossing his former bearings round the whole horizon.

Out of the same range of hills, running nearly north and south, rise three other peaks, which he named Mounts Roe, Mitchell, and Frankland. Between this and a more easterly parallel range, Dr. Wilson is satisfied, from his own observation, and from the accounts of the natives they fell in with, that a tract of good land will be found extending into the original intended limits, and now a part, of the Swan River Settlement; and he observes, 'crediting the report of the natives, which, from the correctness 'of their description of the nature of the land to the eastward, and 'from their general intelligence, I am justified in doing, much 'excellent land may be found to the north-east, beyond the 'second range of hills. I do not,' he adds, 'hesitate to say, 'without fear of future contradiction, that the area passed over 'by us contained as much, if not more, land, fit for all rural purposes, as any portion of equal extent, at least as far as I know, 'in New South Wales.'

Numerous lagoons or lakes of fresh water occurred, to one of which they gave the name of Loch Katrine; it was from seven

to eight miles in circumference, and frequented by vast flocks of black swans, wild ducks, and various kinds of aquatic birds. The streams issuing from the two ridges, east and west of their route, were equally numerous: and three of them, named the Denmark, the Hay, and the Sleeman, were of considerable magnitude, being in several parts not less than a hundred yards in width, and deep enough in parts to float a vessel of two or three hundred tons. All the streams had a southerly direction, and the three above named fell into an extensive inlet, which communicated with the sea by a channel composed of loose calcareous sandstone, about seven hundred yards in width, but which, as was afterwards found, is contracted occasionally to thirty or forty yards; even then it has a sufficient depth of water to admit of boats. On a subsequent visit to Mount Lindsey, by Captain Barker, the resident, accompanied by the intelligent native belonging to the establishment at the post of Frederickton, another large inlet was seen about thirty miles more westerly, lying between Cape Chatham and Point Nuyts; and the opinion of the natives they met with was, on comparing it with the former inlet, that vessels of very considerable size might pass into it through the entrance. Captain Barker, as well as Dr. Wilson, bears testimony to the general accuracy of the descriptions given by these aborigines; he observes, however, as they cannot swim, and possess no kind of floating vessel, they have no means of speaking correctly as to the depth of waters that are not fordable.

As no survey has been made of that part of the southern coast lying between Cape Leuwin and King George's Sound, except that of ascertaining the positions, in sailing along it, of a few inlets, rocks, and projecting headlands, it is not improbable that, on a closer inquiry, many inlets of a similar kind will be found on this line of coast, towards which the internal waters pursue their courses to the ocean. Indeed, there is every appearance of the mouth of a river existing in the large opening which is left in the charts, a little to the eastward of Cape Leuwin, at the bottom of an open bay named 'Dangerous Bight;' and when it is considered, that the late expedition of Captain Sturt has been the means of bringing to light the existence of a river, whose course cannot be less than fifteen hundred miles, and may be much more; that it forms an estuary or lake of sixty miles in length, and from thirty to forty in width, through which its waters are discharged into the sea in Encounter Bay; that Flinders surveyed the western point of this bay, which he called Cape Jervis; that Baudin, who sailed round it, has laid down an uninterrupted line of coast; and that both were unconscious of any such river or estuary,—it is not assuming too much to conclude, that many rivers and inlets still remain to be discovered on this, and, indeed,

on every other, coast of Australia, which measures in the whole extent from six to seven thousand geographical miles.

Since the date of the preceding remarks another report has been received from Captain Stirling, brought down to the end of October, 1830. In this report he observes that 'the progress of the settlement during the present year, although not unopposed by many adverse circumstances, has been as rapid as could have been expected or desired.' He says, indeed, 'that a greater increase than that which has taken place of ships, persons, and property, would probably have been disadvantageous to the welfare of the settlement while struggling in its infancy;' and he adds, 'that although individuals may have suffered in the undertaking, the settlement is now securely established, and its future prosperity no longer doubtful. Much has yet to be accomplished for its advancement, and there will probably be much individual disappointment and distress; but with a healthy climate, abundance of good land, an advantageous position for trade, and some valuable indigenous products, I trust the issue of the undertaking will not disappoint public expectation.'

In order to make himself acquainted with the nature of the country to the southward, the Lieutenant-Governor embarked with the Surveyor-General and some others on board a schooner; examined Geography Bay throughout its whole extent, and explored the interior to some little distance; the surface was uneven, rising into high granitic hills, most of them rugged or sandy on their summits, but the valleys contained a considerable quantity of excellent land.

The Vasse River was the next point examined, to the distance of three or four miles from the coast, but the result was not satisfactory, the soil being too light and sandy; but the straight and vigorous growth of the trees seemed to contradict the apparent poverty of the soil. Fresh water was abundant in this district.

They next anchored off the bar of Port Leschenault, where the country presented so favourable an appearance, that a detachment of the sixty-third regiment was landed, together with stores and provisions for the better support of the settlers; and such were the facilities for these troops housing themselves, from the abundance of building materials, that in a very few days the party was comfortably lodged, and were protected against the approaching winter.

From hence a party set out and explored the country in every direction, as far as the summits of the Darling range. The whole of this range, consisting of well-wooded hills and fertile valleys, continued to bear the character of great productiveness as far as the eye could reach to the eastward. The general result of these

explorations may thus be briefly stated. The water which forms the little harbour of Leschenault receives three rivers; one flowing from the south-east, called the Preston; one from the east named the Collie; and one from the north-east, joining the Collie, to which no name appears to have been given. The banks of all these are composed of rich alluvial soil. The Preston is navigable for the largest boats about five miles from its mouth, and is at that point a running stream of good fresh water. The adjoining country is well clothed with timber trees. The Collie is navigable ten or twelve miles, nearly up to the first range of the hilly country. At first the banks are sandy, but from the junction of the northern stream it improves greatly, and becomes of an excellent description. On the whole, the district around Port Leschenault appeared so favourable for settlers, that Captain Stirling left the detachment above-mentioned for the protection of those already there, and such others as might be induced to avail themselves of the grants of land which the Lieutenant-Governor was prepared to make. The climate is stated to be decidedly cooler than at Swan River, and judging from the quantity of grass and the verdure of the foliage, it appeared to the party that this district was capable of sustaining a dry season better than the country farther to the northward, and that the duration of drought was not so long. It was thought remarkable, that in the whole of their excursions no natives were seen, though traces of them were evident and numerous in several places.

On a second excursion to the southward by the Lieutenant-Governor, accompanied by Captain Currie of the navy, and Lieutenant Roe, the Surveyor-General, they doubled Cape Leuwin, and anchored off the mouth of an inlet communicating with the sea in the north-west corner of the great bay, commencing with the Cape, and extending easterly as far as the Black Point of Flinders. In the charts it is called 'Dangerous Bight,' but can only be said to be dangerous when the southerly winds prevail. This discovery of an inlet and river in this particular spot is just what is anticipated in the former part of this report. Here it was determined to establish a town, to be called 'Augusta,' where a river, which was named the 'Blackwood,' fell into the inlet; and several settlers, to the number of fifty persons, including three heads of families, their servants, and children, disembarked together, with a detachment of troops for their protection. The following is the substance of the Surveyor-General's report:—

'The portion of the southern coast seen during the excursion, taken in connexion with our previous knowledge, leads to the belief, that there are three distinct parallel ranges of primitive mountains, traversing that part of the territory of Western Aus-

‘ tralia which borders on the sea-coast, in the direction of north
‘ and south. The highest and easternmost of these has its southern
‘ termination near to King George’s Sound. The second termi-
‘ nates at Cape Chatham, and is that of which General Darling’s
‘ range behind Swan River is a portion. Cape Leuwin is the
‘ southern termination of the third range, which is inferior in
‘ altitude as well as in extent to the other two, disappearing at
‘ Cape Naturaliste, and only showing itself again at “ Moresby’s
‘ Flat-topped Range,” about half-way between Swan River and
‘ Shark’s Bay, or three hundred miles to the northward of, and
‘ on the same meridian with, Cape Leuwin.

‘ On these ranges and their intervening valleys the soil varies
‘ according to position and altitude. On the mountains and
‘ higher hills the surface is rugged and stony; in the lower sides
‘ of both the soil is excellent; but in the principal valleys and
‘ the lower grounds, where the sandstone formation prevails, it is
‘ of a very inferior description, except where the alluvial deposit
‘ of the rivers gives it a different character. These general rules
‘ are exemplified in the neighbourhood of the newly established
‘ town of Augusta, and may be taken as applicable generally to
‘ all other parts of the territory, except on the sea-coast, where
‘ the regular formations have been invaded and modified by ex-
‘ traneous substances, generally of a calcareous nature.

‘ The position chosen for the new town possesses the advan-
‘ tages of excellent soil, plenty of good water, a pleasant aspect,
‘ and easy access in moderate weather to the anchorage, and to
‘ the interior country. The inlet is of considerable extent, and
‘ leads to the river we called “ Blackwood,” and which has a
‘ southerly direction for fifteen miles, and a westerly one ten
‘ miles, before it ceases to be navigable by boats. Its banks are
‘ covered with good timber of the stringy bark and red gum; but
‘ the soil is a light sandy loam, which is seldom sufficiently strong
‘ for successful cultivation. The best soil, the finest blue-gum
‘ timber, and some good grass, are mostly to be found on hilly
‘ land; but on the general surface there is usually found food for
‘ cattle, and very good sheep pasture on the downs skirting the
‘ coast. The anchorage is sheltered from the usual winter winds,
‘ but is open to those which blow between south and east-south-
‘ east. The position of Augusta, with reference to the navigation
‘ of these seas, and the quality of the surrounding country, will
‘ make it a convenient place for vessels to stop at, on their way
‘ to the eastern colonies from England, India, and the Cape; and
‘ on these grounds there is great reason to hope, that it will soon
‘ rise to a considerable degree of commercial prosperity.’

Another discovery has been made by Ensign Dale and a small
party on the eastern side of Darling’s range, and at the distance

of fifty miles due east from Perth. Having reached the eastern base of this range, they found the waters taking an easterly direction, and discharging themselves into a river of considerable magnitude, running north-west, about sixty yards in width, very deep, and having a strong current. This river, in all probability, will be found to discharge itself into some inlet on the coast; perhaps in some part of the unexamined coast of Shark's Bay,—though Captain King is inclined to think its mouth will rather be found somewhere about 'Moresby's Flat-topped Range,' where, in passing, he observed clefts in the hills, and a finely-wooded country down to the sandy beach. The hills of the Darling range were generally covered with a red loamy soil, producing good grass and wild vetches. The trees were chiefly of mahogany, of a very vigorous growth, the blue and red gum, and a few Banksias. Where the waters first began to take an easterly course, the trees were chiefly of blue gum, casuarina, and black wattle, and a tree which is stated to be similar in its growth to an apple, bearing a fruit resembling in form, but exceeding in size, an unripe hawthorn berry. The wood of this tree had a remarkably sweet scent, and the bark a delicate pink colour. Mr. Dale says, 'a specimen which we brought home with us has been pronounced by some professed judges to be a species of sandal-wood.'

They met with no natives except three men on their return, who were very civil, and desirous of making themselves useful; but they observed many traces of them: and in ascending the great river, about twenty-four miles, to a spot where the hills assumed a rugged and romantic character, they discovered, under a great mass of granite, a large cavern, the interior of which was arched, and had all the appearance of an ancient ruin. 'On one side,' says Mr. Dale, 'was rudely carved what was evidently intended to represent an image of the sun; it being a circular figure about eighteen inches in diameter, emitting rays from its left side, and having within the circle lines meeting each other nearly at right angles. Close to this representation of the sun were the impressions of an arm and several hands.' It is stated, that from these heights the view to the eastward, for twenty to thirty miles, exhibited an undulating surface and a well-wooded country.

II.—General View of the Botany of the Vicinity of Swan River.

By R. Brown, Esq., F.R.S. Read 22d Nov., 1830.

THE vegetation of the banks of Swan River, and of the adjoining country to the southward, is at present known chiefly from the report of Mr. Charles Fraser, the Botanical Collector, who accompanied Captain Stirling in his examination of that district in 1827, and from collections of specimens which were then formed.

I have inspected, and in part examined, two of these collections; one of which I received from Mr. Fraser himself, through my friend Alexander Macleay, Esq. the Secretary of the Colony of New South Wales; for the second I am indebted to Captain Mangles.

The number of species in both collections does not exceed one hundred and forty; and some dicotyledonous herbaceous tribes, as well as grasses, *Cyperaceæ* and *Orchideæ*, are entirely wanting.

From materials so limited in extent, but few general observations can be hazarded on the vegetation of this portion of the south-west coast of New Holland.

The principal families of plants contained in the collections are *Proteaceæ*; *Myrtaceæ*; *Leguminosæ*, such especially as belong to *Decandrous Papilionaceæ*, and to the *Leafless Acaciæ*; *Epacrideæ*; *Goodenoviæ*; and *Compositæ*. And the more conspicuous plants, not belonging to any of these families, and which greatly contribute to give a character to the landscape, are, *Kingia Australis*, a species of *Xanthorrhæa*; a *Zamia*, nearly allied to, and perhaps not distinct from, *Z. spiralis* of the east coast, although it is said frequently to attain the height of thirty feet; a species of *Callitris*; one or two of *Casuarina*; an *Exocarpus*, probably not different from *E. cupressiformis*; and *Nuytsia floribunda**, a plant hitherto referred to *Loranthus*, but sufficiently distinct in the texture and form of its fruit, and now named in memory of the discoverer of that part of the coast to which this very singular tree is nearly limited.

If an opinion were to be formed of the nature of the country merely from the inspection of these collections, it certainly would be extremely unfavourable as to the quality of the soil; for not only do the prevailing families already enumerated, but the whole of the genera of those families, and even many of the species, agree with those found on the shores of King George's Sound, which, with the exception of a few patches of very small extent, seem absolutely incapable of cultivation.

The opinion so formed, however, would be necessarily modified in noticing the entire want in the collections of tribes, all of which

* *Loranthus floribundus*.—*Labill. Nov. Holl.* i. p. 87, t. 113.

must be supposed to exist, and some even in considerable proportion, in the tract examined; in allowing for the unfavourable season when the herbarium was collected; in admitting the statements in Mr. Fraser's report, respecting the abundance and luxuriance of *Anthistiria australis*—the kangaroo-grass of New South Wales; from the account given in the same report of the extraordinary size of some arborescent species of *Banksia*, which, in the neighbourhood of King George's Sound, generally form small trees only; and lastly, in adverting to the important fact stated by Captain Stirling in his despatch to Government—namely, that the stock had not only been supported through nearly the whole of the dry season, but that most descriptions of it had even fattened on the natural herbage of the country.

From these more general observations I proceed to make a very few remarks, chiefly relating to the geographical distribution of some of the families or more interesting species, either contained in the herbarium, or distinctly noticed in Mr. Fraser's report.

The striking resemblance in general character, and the identity of many of the species with those of King George's Sound, have been already mentioned. But this portion of the shores of New Holland, extending from Swan River on the west coast to Middle Island, in $123^{\circ} 10'$ east long., on the south coast, may be said to contain the greatest proportion of those genera which form the chief peculiarities of New Holland vegetation.

In comparing the Flora of the district of Swan River with more distant regions of the same continent, it may be remarked, that probably not more than four or five species are common to this part of the west coast, and to the same parallel of the east coast of New Holland; and that even the existence of some of these species at Swan River is not altogether certain.

In the collections which I have examined there is no specimen of *Anthistiria australis*, or kangaroo-grass of New South Wales; but as this valuable grass must have been well known to the Botanical Collector, and as it is perhaps the most general plant in New Holland, I have no hesitation in admitting its existence on the authority of Mr. Fraser's report.

Mesembryanthemum aquilaterale is neither contained in the herbarium, nor mentioned by the collector. I find, however, in one of the letters from Swan River, published by Mr. Cross, a plant noticed as a pot-herb, that, from the account of the writer, is probably this plant, which, next to *Anthistiria australis*, is perhaps the most widely-diffused species in the Flora of New Holland.

The third species is *Pteris esculenta*, the only fern found by Mr. Fraser, and which is both general and abundant beyond the tropic in New Holland and in Van Diemen's Land.

The *Zamia*, already noticed, if not specifically different from *spiralis*, would furnish another example of a plant peculiar to New Holland, and very generally found in the extra-tropical parts of that continent. I had, however, myself observed on the south coast a *Zamia* of at least ten feet in height, which I suspected might be distinct from *Z. spiralis* of the neighbourhood of Port Jackson, and which is probably the same with that of Swan River.

The *Exocarpus* of the Swan River may possibly differ from *cupressiformis*, though there is nothing in the specimens to make it probable that it is specifically distinct. But *Exocarpus cupressiformis* is found very generally, not only in the southern parts of New Holland and Van Diemen's Land, but also within the tropic.

The last plant in the collection whose range is very extensive remaining to be noticed, I have not been able to distinguish from *Arenaria marina* of the shores of Europe.

Of the families existing in the vicinity of Swan River, the most striking, as well as the most extensive, is *Proteaceæ*, a tribe which, from its general dispersion, and the remarkable forms of its numerous genera and species, includes many of the chief peculiarities of the vegetation of New Holland.

In Mr. Fraser's collection, the principal genera of this order are *Petrophila*, *Isopogon*, *Hakea*, and *Banksia*; and these are also the most abundant in the districts of King George's Sound and of Lucky Bay. The number of pieces of the two first-mentioned genera confirms the remark made in the Botanical Appendix to Captain Flinders's Voyage—namely, that in New Holland, at the western extremity of the parallel of latitude in which the great mass of this order of plants is found, a closer resemblance is observable to the South African portion of the order than on the east coast, where those allied to the American part chiefly occur.

This is not the place to enter into a particular account of the new species of this family existing in the collections from Swan River. I may observe, however, that the number is considerable, and that their specific characters have been recently published*.

The *Myrtaceæ* of Swan River belong chiefly to *Melaleuca*, *Beaufortia*, *Calothamnus*, *Calythrix*, *Billottia*†, and *Eucalyptus*.

Of *Eucalyptus*, the only species in the collection had been first found in Captain Flinders's Voyage at King George's Sound, on

* Suppl. I. Prodr. Flor. Nov. Holl.

† A genus distinct from *Leptospermum*, to which the few species hitherto published, namely, *B. marginata*, *flexuosa*, and *linearifolia*, have been referred.

the shores of which it was the only useful timber-tree, though there of very moderate size. I have named it *Eucalyptus calophylla*. Mr. Fraser describes it as forming, on the banks of the Swan, a large forest-tree, and erroneously refers it to *Angophora*, a genus which is limited to the east coast of New Holland. Other species of *Eucalyptus*, forming the timber of the country, are mentioned in the report, and considered to be some of the common gum-trees of Port Jackson, from which, however, I have no doubt they will prove to be distinct; for I am acquainted with no species of this genus common even to the east and south coasts of New Holland.

I shall conclude with a remark relating equally to the genus *Eucalyptus* and to the leafless *Acaciæ*, several species of which are found in the collection. This observation I have formerly made in the Appendix to Captain Flinders's Voyage in the following terms:

‘These two genera are not only the most widely diffused, but by far the most extensive in Terra Australis, about one hundred of each having already been observed; and if taken altogether, and considered with respect to the mass of vegetable matter they contain, calculated from the size as well as the number of individuals, are perhaps nearly equal to all the other plants of that continent. They agree very generally also, though belonging to very different families, in a part of their economy, which contributes somewhat to the peculiar character of the Australian forests—namely, in their leaves, or the parts performing the functions of leaves, being vertical, or presenting their margin, and not the surface, towards the stem, both surfaces have consequently the same relation to light.

‘This economy, which uniformly takes place in the *Acaciæ*, is in them the consequence of the vertical dilatation of the foliaceous petiole; while in *Eucalyptus*, where though very general, it is by no means universal, it proceeds from the twisting of the footstalk of the leaf.’

To this quotation it may be added, that these two genera still more uniformly agree in the similarity of the opposite surfaces of their leaves. But this similarity is the indication of a more important fact—namely, the existence equally on both surfaces of the leaf of those organs, for which, as I believe them to be in general imperforated, I have adopted the name of *cutaneous glands*, but which by most authors are denominated pores, or *stomata* of the *Epidermis*.

In leaves, especially of trees and shrubs, these glands are generally found on the under surface only; while among arborescent plants in a very few instances, as in several *Coniferae*, they are confined to the upper surface.

In addition to the two extensive New Holland tribes here mentioned, there are many other cases in which these organs occupy both paginae; and I am inclined to think such cases more frequently occur on that continent than in any other part of the world. It is at least certain that on this microscopic character of the equal existence of cutaneous glands on both surfaces of the leaf, depends that want of lustre which is so remarkable in the forests of New Holland.

III.—*Description of the Natives of King George's Sound (Swan River Colony) and adjoining Country.* Written by Mr. Scott Nind, and communicated by R. Brown, Esq., F.R.S. Read 14th Feb., 1831.

[The following observations on the Aborigines inhabiting the vicinity of King George's Sound, and which probably apply to all those in immediate contact with our new colony, have been communicated to me by Mr. Nind, the medical officer who accompanied a small settlement or post, established in 1827, on the shore of that harbour, and who remained with it till October, 1829.

From the friendly disposition and frequent visits of the natives during the greater part of that period, opportunities, such as but seldom occur, were afforded of collecting interesting information respecting their customs and manner of life, particularly from some of the more intelligent individuals, who at length became generally resident in the settlement.

Of these opportunities Mr. Nind diligently availed himself, and the following result of his observations appears to me to form an important contribution to the history of the race. A short account of the settlement to which he was thus attached, and of the adjoining country, is prefixed.—R. BROWN.]

KING GEORGE'S SOUND, the entrance of which is in latitude $35^{\circ} 6' 20''$ south, and longitude $118^{\circ} 1'$ east of Greenwich, is situated on the south coast, but very near the south-west extremity of New Holland.

It is very conveniently placed for the purposes of refreshment and refit for vessels bound to New South Wales or Van Diemen's Land; and, from the circumstances of the recent establishment of the Swan River Colony, particularly useful, as it affords an excellent harbour—perhaps, indeed, the only really good one in the neighbourhood of this new colony.

It was discovered by Captain Vancouver, in the year 1792; was subsequently visited by Captain Flinders and the French expedition of discovery under Commodore Baudin; more recently by Captain King; and since that period has been frequently resorted to by sealing vessels, for the neighbouring coast to the eastward is fringed with a multitude of rocks and islands, upon which many seals of the black furred species have been found.

The port has been carefully and sufficiently described by Captain Flinders, and a correct plan of the Sound is given by that navigator in the atlas of his voyage.

The situation and excellence of the harbour, together with the sanguine expectation of finding a good country in the interior, induced the government of New South Wales to form a settlement there; and, accordingly, at the latter end of the year 1826, a party, consisting in all of fifty-two persons, was despatched under the command of Major Lockyer, of His Majesty's 67th regiment, for that purpose. The little expedition sailed on the 7th November, 1826; and after a tedious passage, arrived at its destination on the 25th December following.

From Captain Flinders' account of the place, it will be seen that besides the outer sound, there are two inner basins or harbours which are perfectly land locked, and offering every security for ships. The northern one, Oyster Harbour, is fronted by a bar of sand, on which there is not more than thirteen feet and a half at high water; and within it is so full of shoals—excepting at the entrance, and near Green Island, where small vessels may ride securely at their anchors or be moored to the shore—that there is scarcely water enough for a boat to approach the beach; the greater part being a bank that dries, or nearly so, at low water, excepting in the drains of two small rivers that fall into the head of the harbour, which are navigable for a few miles by small boats.

In the centre of Oyster Harbour is Green Island, a small islet upon which Vancouver sowed many garden seeds; but if they prospered they were probably destroyed by vermin, for future visitors could discover no traces of them.

The shoal character of the shores of this harbour therefore offering no inducement to the new colonists to establish themselves in its neighbourhood, they determined upon occupying the shore of Princess Royal Harbour, situated at the back or west side of the sound, into which vessels of a considerable size might enter, and ride at their anchors, very close to the shore, in perfect security.

The party therefore encamped at the base of what they afterwards called Mount Melville. It is on the north side of the harbour, about a mile within the entrance, and close to the spot occupied by Captain Flinders in the year 1801*. In many respects

* The number of the colonists, being at first only fifty-two persons, up to the period of the departure of the author of this paper in October, 1829, had very little increased. The settlement consisted only of eight or ten buildings, some of which were brick nogged, others of turf, and others of wattle and plaster. The roofs were thatched with rushes or coarse grass. At the commencement it received the name of *Frederick Town*; but as the appellation has not been adopted in the official documents, it remains uncertain whether it will be continued. At one period, the settlement was expected to be abandoned, but the recent discovery of good land at Geographie Bay, and the favourable account of the interior afforded by Dr. Wilson, now render this improbable.

the situation proved eligible; but in the most essential thing, good water, it was very deficient. Neither was there any timber found near the place that was serviceable for erecting buildings. And the want of these two important articles was a great drawback to the settlement, particularly in its early days.

The soil in the immediate neighbourhood of the encampment proved to be very unproductive, for on turning it up a few inches beneath the surface, it was nothing but a pure white sand. In the bogs or swamp, however, the subsoil was found to be of a peaty nature. The poverty of the soil, therefore, offering great difficulties for the cultivation of a sufficient supply of vegetables, various spots were selected for the purpose, among which the little islet in Oyster Harbour, Green Island, small as it is, turned out to be the most productive.

So favourable, however, is the clime to vegetation, that where a small supply of manure could be obtained, the crops were not only certain but luxuriant. The vegetables that were raised consisted of peas, potatoes, cauliflowers, cabbage, cucumbers, &c.; melons, pompions, water melons, and maize also succeeded without forcing when the season was warm, but these latter vegetables could not be depended upon.

The island in the Sound produced sowthistles, mallow, and wild celery, which were used by the colonists during an attack of scurvy, and proved to be very serviceable in removing the disease. The sowthistles and celery grew also on the sea-beach*.

The general appearance of the country, although of a barren nature, is very picturesque. The hills behind the settlement are studded and capped by immense blocks of granite, and are strewn with a profusion of beautiful shrubs, among which the splendid *Banksia* grow to a large size, and the *Kingia* and *Xanthorrhoea* or grass-tree are abundant.

In some parts the soil is of a reddish hue, and here the trees are more abundant and of larger size. They consist of various kinds of eucalyptus and casuarina (like the swamp oak of Port Jackson). Generally, however, the trees are decayed at the heart, and are therefore unserviceable for building.

The view to the north is over a country in appearance flat, but in reality formed by wooded banks, separated by swampy plains. On the banks, the honey-suckle (a colonial name for a small species of *Banksia*) predominates.

The plains are covered with a coarse herbage, but no grass

* A species of parsley (*apium prostratum*), and another of orach (*atriplex halimus*, Brown, Prod.), were used by my people. The latter, particularly, afforded us a very good substitute for vegetables. We found no celery; and it seems probable, that the wild celery mentioned above is the plant here described.—P. P. K.

across the forehead and down the cheek bones. The women put on the white colour in large blotches.

Painting the body, with the natives of this part of the country, is not, as in New South Wales, a sign of war. It is considered by them merely as an ornament, and is never neglected at their dances, or when they visit neighbouring tribes. It is a very general practice at those seasons of the year when they can procure fat from fish or animals; but there are some individuals, we have remarked, who very seldom use it.

They have the same practice amongst them as at Sydney, of cutting gashes on their body, and raising an elevated cicatrix. It is done chiefly on the shoulders and chest; and is both a distinguishing mark for different tribes, and an honorary distinction. The septum of the nose is also perforated, through which a feather or other substance is worn. Ornaments of dress, however, are not considered as marking the man of authority, for they are only worn by the young single men. The cicatrized wounds on the body are the marks of distinction, and even these are tribual more than personal.

Every individual of the tribe, when travelling or going to a distance from their encampment, carries a fire-stick, for the purpose of kindling fires, and in winter they are scarcely ever without one under their cloaks, for the sake of heat. It is generally a cone of *Banksia grandis*, which has the property of keeping ignited for a considerable time. Rotten bark, or touchwood, is also used for the same purpose. They are very careful to preserve this, and will even kindle a fire (by friction, or otherwise) expressly to revive it.

Their weapons consist of spears of two or three kinds, which are propelled with a throwing-stick (*meara*). They have also a knife, stone-hammer, and a *curl*, or a curved flat weapon similar to the boomerang of the New South Wales natives*.

The spears (*keit*) are made of a long slender stick about the thickness of a finger, of a heavy, tough quality. They are scraped down to a very fine point, and are hardened and straightened by the assistance of fire. Those intended for hunting and fishing, called *maungull*, are barbed with a piece of wood fastened on very neatly and firmly with kangaroo sinew (*peat*), and the ligature covered with gum obtained from the grass tree†. They are about eight feet in length. The war spears are longer and heavier, and are armed, for five or six inches from the point, with pieces of sharp stones fixed in gum, resembling the teeth of a saw, the stones increasing in size, the smallest being at the point. Each man carries from two to five spears.

* For a further description and representations of the above-mentioned weapons, see King's Australia, vol. i. p. 355, vol. ii. p. 138, *et seq.*

† Xanthorrhæa.

The throwing-stick (*meara*) differs considerably in shape from those used at Sydney, being much broader. It is about two feet long, and four inches wide, narrowing at each extremity. At the handle is fixed a piece of gum (*wank*), in which is inserted a sharp-edged stone (*tockil*), which is used to scrape the point of the spear when blunted by use. At the outer end of the *meara* is a small wooden peg (*mert*), which is inserted into a hole at the end of the spear, and by which it is propelled. The *meara* is also used at close quarters in their fights.

The hammer (*koit*) is made with a lump of gum, having two stones imbedded in it, stuck on to the extremity of a short stick. It is used in climbing trees, in throwing at and killing animals, in breaking down grass-trees, and for the common purposes of the axe or hammer.

The knife (*tāāp*) is a stick with sharp-edged stones fixed in a bed of gum at the end, and for two or three inches down the side, forming a serrated instrument.

A short stick, which they call *towk*, is also used for throwing at or striking small animals, such as the *quernde* and *tamur*, the former resembling the bandicoot and the latter the wallaby, or brush kangaroo of New South Wales.

The *curl*, or boomerang, is seldom used as a weapon, nor are they so expert in the use of it as the New South Wales blacks. The natives, however, say, these instruments are more common in the interior. They are used for skinning the kangaroo, and also for amusement.

Their wigwams* (*tourloits*) are merely composed of a few small twigs stuck in the ground, and bent over in the form of a bower, about four feet high, and five or six wide. Sometimes two are united. They also thatch them slightly with the leaves of the grass tree. In rainy weather they are roofed with pieces of bark, upon which stones are placed, to secure them from being blown away; but they afford a miserable protection from the weather. They are generally erected in a sheltered spot near water, with the back towards the prevailing wind, and a fire is kept burning constantly in the front. One of the huts contains several individuals,

* The huts of the New Hollanders differ very materially among different tribes. Generally they are of very rude and simple construction. At Port Jackson they are merely formed of a strip of bark bent over like the roof of a house, and are scarcely large enough to cover the body. At Port Macquarie, however, they are of similar form to those above described, but of larger size, and, perhaps, neater construction. The form of the huts must depend very much upon the productions of the country. Where the stringy bark, the best suited for this purpose, is easily procured, as is the case at Port Jackson and the south-east coast, it is by far the best material for the purpose, for it affords shelter and warmth, and is impervious to rain. The settlers of the colony of New South Wales have found the utility of it, for all their cottages are roofed, and many are entirely covered in with it. P. P. K.

who lie covered in their mantles, huddled together, in a crowded state: the dogs also are admitted to a share of their bed.

An encampment rarely consists of more than seven or eight huts; for, except during the fishing and burning seasons, at which times large parties assemble together, their numbers are generally small, and two or three huts suffice. The number of individuals, however, seldom exceed fifty. The huts are so arranged as not to overlook each other. The single men have one to themselves—the children sleep with the women in a large hut near the husbands. These encampments generally consist of near relatives, and deserve the name of families rather than of tribes.

Those families who have locations on the sea-coast quit it during the winter for the interior; and the natives of the interior, in like manner, pay visits to the coast during the fishing season. Excepting at these times, those natives who live together have the exclusive right of fishing or hunting upon the neighbouring grounds, which are, in fact, divided into individual properties; the quantity of land owned by each individual being very considerable. Yet it is not so exclusively his, but others of his family have certain rights over it; so that it may be considered as partly belonging to the tribe. Thus all of them have a right to break down grass-trees, kill bandicoots, lizards, and other animals, and dig up roots; but the presence of the owner of the ground is considered necessary when they fire the country for game. As the country does not abound in food, they are seldom stationary, removing, according to the time of the year, to those parts which produce the articles of provision that may be in season. During the winter and early spring they are very much scattered; but as summer advances they assemble in greater numbers.

It is at this season that they procure the greatest abundance of game. It is done by setting fire to the underwood and grass, which, being dry, is rapidly burnt. The manner in which these burnings are performed is as follows:—

With a kind of torch made of the dry leaves of the grass tree, they set fire to the sides of the cover by which the game is enclosed and cannot escape. The hunters, concealed by the smoke, stand in the paths most frequented by the animals, and with facility spear them as they pass by. On these occasions vast numbers of animals are destroyed. The violence of the fire is frequently very great, and extends over many miles of country; but this is generally guarded against by their burning it in consecutive portions. The women also kindle fires, but only for the purpose of taking bandicoots; they sometimes, however, accompany the men at the larger firings for kangaroos, or wallaby.

As soon as the fire has passed over the ground, they walk over the ashes in search of lizards and snakes, which are thus destroyed

in great numbers, and those which have escaped in their holes are easily discovered.

In the chase the hunters are assisted by dogs, which they take when young and domesticate; but they take little pains to train them to any particular mode of hunting. These dogs appear to have a very fine scent, and draw upon their game like a pointer; after which they spring upon or chase it. They are particularly useful in catching bandicoots, the small brush kangaroo, and the opossum, but for the emu and large kangaroo they are not sufficiently fleet. The owner of a dog is said to be *toōrt-a-din*, and is entitled to an extra proportion of the game killed. They are also frequently lent out upon consideration of the owner receiving a share of the produce.

The food of the dogs consists of a considerable portion of vegetables, roots roasted and pounded, the entrails of animals, and such bones as are too hard for the teeth of the natives. At some periods it is so scanty as to compel the dog to leave his master and provide for himself; but after a few days he generally returns.

When the owner does not wish the dog to follow, he ties the fore-leg to the neck with a band of rushes, and leaves him in a shady place. He frequently carries the dog upon his shoulders. When they are puppies, between six and twelve months old, they are called *jimmung*,—they are then used to hunt lizards and bandicoots; and previous to this they are consigned to the care of the women. They seldom bark, but bite very sharply, snapping like a fox. They are excellent watch dogs, and will attack strangers.

In the wild state they are sometimes killed by the natives, who eat their flesh, but of the skin no use is made*. Upon finding a litter of young, the natives generally carry away one or two to rear. In this case it often occurs that the mother will trace and attack them; and being of a large size, and very strong, they are rather formidable. But, in general, they will stand and look for a few moments, and leisurely retire.

The mode in which they hunt the kangaroo is in small parties, or singly. They select a time when the rain is pouring heavily, or the wind blowing hard, to prevent the noise of their approach from being heard, for the kangaroo is very quick of hearing, and always on the alert. The hunter creeps upon them with the greatest caution, and generally succeeds in approaching them unobserved. They always, if possible, keep the wind in their face, and when one is observed, they take off their cloak, and watching

* The tail is frequently used as an ornament for the arm or wrist, &c.—See King's Australia, vol. ii. p. 143.

when the animal stoops or turns his back upon them, they hastily advance, keeping a bush between them for concealment. As they approach their prey they move very lightly in a stooping posture, and only at the time when the noise of the wind prevents their footsteps being heard. Should the kangaroo turn round and observe them, they instantly stop and remain perfectly motionless until he resumes his feeding. In this way they approach within a few yards of their prey, and then pierce him with their spears. The instant he falls they run up and dispatch him with their hammers by blows on the head. The first operation is to extract the two front teeth of the lower jaw, which they use to sharpen the spear points; then they seize the tail, and taking the end in the mouth, bite off the tip, and, by pulling, extract the sinews which are inserted in it: these are bound round a stick and dried for use, either for the purpose of stitching the mantles, or tying the barbs on the spears.

Another mode of hunting the kangaroo, when the huntsmen are numerous, is by surrounding and gradually approaching the game until they get sufficiently near to spear them.

They are also sometimes killed in *woits*, but this plan is more used for the small or brush kangaroo. In this case a portion of the brush is surrounded, and each person begins breaking it down and treading over it, so as to make a complete road all round, carefully stopping the runs of the animals. One or two of the hunters then go in with their dogs, and as the game attempts to pass the clear spot, they are entangled in the brush and knocked on the head. In this way they sometimes kill a great many; it is practised almost entirely in the spring before the burning season commences, but it requires a number of people, and the whole of the males of the tribe are generally present.

Both the large and small kangaroo are caught in pit-falls, set in wet places. These pit-falls are described by the natives to be covered over with bushes and lightly sprinkled with soil. This method is mostly used in the interior.

The emu is speared chiefly in the winter, at which time they lay their eggs. When a nest is found, the hunters conceal themselves behind a bush near it, and endeavour to secure the male bird first. The female they are pretty certain of, unless she has been disturbed, when she will forsake the nest. Emus, however, are not very often procured by the natives, but, with the kangaroo, are highly esteemed as articles of food. Lizards, also, afford a favourite repast; and, at some seasons, form a considerable portion of their food. There are three species that are eaten—the largest, called *munnāar*, appears to resemble an iguana found at Sydney; it is long, and generally very lean and lank. At one season, how-

ever, it is fat, and very good eating. It makes a hole in the nest of a species of ant, which is a mound of earth four or five feet high, the inner parts consisting of cells constructed of a gummy substance mixed with earth, and is very hard; yet the munnāar burrows from the top nearly to the bottom, and there deposits its eggs, which are the size of a large pigeon's egg, covered with a thick pellicle as tough as parchment. The eggs are about ten or twelve in number, and adhere together. The ants soon repair the hole made by the munnāar, and the warmth of the nest is sufficient to hatch the eggs. These eggs have an oily taste, and will not easily mix with either warm or cold water, but nevertheless they are very good eating.

The second species of lizard, called *wandie*, is of a very dark colour, and has a long round tail. It is generally found among rocks, and conceals itself under them; it also inhabits hollow trees or holes in the ground; and is a very lively animal, and quick in its motions.

The third species, or short-tailed *youern*, has a large head and an enormous mouth, which, when attacked, it immediately opens, and exhibits a purplish coloured tongue; its body is covered with large scales of a grey colour, but having transverse patches of brown. It is very sluggish, and does not burrow in holes, but conceals itself in long grass. They are frequently found in pairs. The female, when pregnant, has two large eggs in her, but I have never seen them when deposited. According to the natives she buries them in the ground very near the surface, and they are hatched by the warmth of the sun. These *youerns* are frequently found in ants' nests, constructed of straw or leaves, with minute portions of sand. I do not, however, know if they lay their eggs there, or whether they feed upon the ants.

The snakes which are eaten by the natives are of several kinds, viz. the *wackul*, *norne*, *docat*, &c. The *wackul* is the common diamond snake of New South Wales, and is not venomous. The *worne* and *docat* are much alike, of very dark colour, six and seven feet in length, and their bite generally fatal. There is another species, of a smaller size, and sienna colour, of which although the bite is venomous it seldom occasions death. Other small species occur which are not eaten.

When the natives kill a snake, they are careful to beat its head to pieces before they take it up; they then examine if it has recently eaten, and if it has undigested food in its stomach, they reject it, for, if eaten, they say it would cause violent vomiting.

At the spring-time of the year, they live principally upon the eggs and young of birds, chiefly of the parrot tribe, but also of hawks, ducks, swans, pigeons, &c. They are extremely expert at climbing trees, which they do by notching the bark with their

hammers, in the same manner as is practised at Port Jackson. Thus they procure opossums, which they trace to their holes by the marks of their claws upon the bark. There are two species, one, the common ring-tail (*nworra*), and the other, *comal*. They are not often found in the same districts, the *comal* living chiefly in lofty and thick woods, whilst the ring-tail is frequently found in swamps and the low brush which surrounds them. The *comal* is of larger size, and much lighter colour, with a brownish bushy tail: it is also fatter; the fur is longer, of a whitish colour, and is used by the natives to spin into a kind of worsted called by them *peteroe*, of which the noodle-buls are made. The fur of the ring-tailed opossum is not used. Of both species it is easily detached from the skin.

The *comal* is frequently hunted with dogs by moonlight, when it is either speared in its flight, or driven into its haunt in some hollow tree. The natives then make a hole and extract it; but should this be too difficult or troublesome, they kindle a torch of grass-tree leaves, and push it into the hole, when, in attempting to escape, the animal is easily taken.

The natives describe other animals which are found in trees, and are very abundant in the interior, one of which may probably be a species of the flying fox, or vampyre bat; but this animal is not found in the neighbourhood of the settlement.

During the summer and autumn months, the natives derive a large proportion of their food from fish. They have no canoes*, neither can they swim, in both of which points they differ materially from all other parts of the Australian continent with which we are acquainted. They can, therefore, only catch those fish which ap-

* The want of proper material for the construction of canoes may possibly be the cause of the natives of King George's Sound not possessing the means of navigating. From the shoal nature of Princess Royal Harbour and Oyster Harbour, it is not of so much consequence, since, for the greater part, they can be waded across; still, from the scarcity of food, visits to the islands in the sound, on which seal abound, would be of great advantage, and from the navigating disposition of the Australian Indians, it seems extraordinary that they have not some mode of conveying themselves across the water. The trees of King George's Sound are not at all adapted to be made into canoes, for they afford no bark that could be used, and are too hard and heavy to be burnt or hollowed out. The natives of the west coast have no canoes, and in a northerly direction from Cape Leuwin, none have been noticed, until at Dampier's Archipelago, on the north-west coast, where the mangrove affords the Indians of that part the means of crossing the sea. It is merely a log, which is sufficiently buoyant to carry two or more people. (See King's Australia, vol. i., p. 43, and the wood-cut in the title-page of the first volume.) Farther to the eastward, at Hanover Bay, the mangrove is the only material used (see vol. ii. p. 69) in the shape of a raft. But on the north and east and south-east coasts, the canoes are made of the bark of the eucalyptus, but are of very different construction. On the north-east coast, between Cape Hinders and the Cumberland Islands, the canoes are a hollowed log of a soft pulpy-wooded tree (*Erythrina Inlea*), and are furnished with an out-rigger. This canoe is described in vol. i., pp. 220 and 225. Other canoes are described in the first volume, at pages 90, 200, and 202.

proach the shores, or come into shoal water. They have neither nets, nor hook and line, and the only weapon they use is the spear, with which they are very dexterous. In the mouths of streams or rivers, they take large quantities, by weirs made of bushes, but the most common method is pursuing the fish into shoal water, and spearing them, or as they lie basking on the surface. During calms, they walk over the mud and sand-banks, in search of flat fish, which are easily detected while lying at the bottom. At night, too, they light torches of grass-tree, and thus see the fish at the bottom, apparently asleep, when they very readily spear them. By these methods, vast quantities are taken, but it can only be done in dead calms. Another common method is to sit on a rock, motionless, and occasionally throw into the water pieces of limpet, or other shell-fish, keeping the spear under water until the bait is seized by a fish, when they are almost certain of striking it.

In the autumn, when the smaller species of fish approach the shores in large shoals, they surround them, and keep them in shallow water upon the flats until the tide falls and leaves them, when they are easily speared, and very few escape. For this purpose they use a very small spear, without a barb, and throw it by hand; should it so happen that the tide does not sufficiently fall to enable them to take the fish, they gather bushes, and plant them round so thickly, as to enclose them, when they are speared at leisure.

Fish being very plentiful, they often kill more than is sufficient for present use; in this case, they roast them, and separating the flesh in large flakes from the bones, pack it carefully up in soft bark, in which way it will keep good for several days.

Immediately on killing a large fish, they make a small opening just below the gills, through which they extract the inside. If there be any fat, it is carefully separated: the bowels, liver, &c. they cook and eat.

Although sharks are very numerous, the natives are not at all alarmed at them, and say that they are never attacked by them*. Sometimes they will spear them, but never eat any part of the body. Sting rays and maiden rays are also common, but not eaten, though sometimes killed for amusement. On some part of the coast the sting is used to point their spears.

Oysters, and other edible kinds of shell-fish, are to be obtained in large quantities. None of them were eaten by the natives previous to the formation of the settlement; but since its establish-

* Though not afraid of sharks in the shallow water of either of the harbours, yet in the river connecting the lakes with Eclipse Bay, they are extremely timid, and will not venture on the trees overhanging the banks.

vagrant life. The population is consequently far from numerous, and varies in appearance and habits according to the nature of the food in their district. This will naturally occasion numerous subdivisions into tribes and classes, which we find to be the case in an uncommon degree; and there appears to be little bond of union amongst them—they have the same name and district, but nothing else; for, when on friendly terms, they seldom associate together, and their wars appear to be more between individuals or families, than between tribes or districts. They have no general camp or rendezvous, acknowledge no general chief, and associate or disperse as season or inclination leads them. What their meetings in the interior may be, I know not: sometimes, perhaps, they may be large, but I believe that, during the winter, (when the sea-coast tribes go into the interior,) they are in small parties, and much scattered, living upon opossums, bandicoots, and kangaroos, &c. They begin to return to the coast about September or October, and at this season they chiefly subsist on roots. In calm weather, however, they procure a few fish.

As the season advances, they procure young birds and eggs, and their numbers increase. About Christmas they commence firing the country for game, and the families, who through the winter have been dispersed over the country, reassemble. The greatest assemblages, however, are in the autumn (*pourner*), when fish are to be procured in the greatest abundance. Towards the end of autumn, also, they kill kangaroos, by surrounding them.

At the dry seasons of the year large districts are abandoned for want of water. They speak much of climbing trees to satisfy their thirst, but I have no knowledge whether it be to procure water from the hollows in the tree, or to extract the sap. I believe they cut a hole with their hammers, and drink, or collect drink in their cloaks, and then carefully close the aperture. In these districts the women climb trees, which is not the case on the coast.

The scarcity of food has occasioned some other customs, which are curious and characteristic. The men and women go out in separate parties, on their respective duties, generally at an early hour in the morning, in companies of two or three together; the women to collect roots or crayfish (*challows*), and the men with their spears, to procure fish or game. The women carry a *waun*, a long pointed stick, with which they dig up roots, and which is occasionally used as a weapon. On their backs they carry a bag (*cote*) made of a kangaroo's skin, in which they deposit the food they procure: they also carry a fire-stick.

A portion of the roots, or whatever they may collect, they cook and eat, but reserve part for the children and men, to be eaten on their return to their huts. They also get lizards, snakes, and

bandicoots, and, in the burning season, set fire to the ground by themselves.

The whole party cook and eat conjointly. They generally go on the open, downy, or swampy land.

The men also go two or three together, unless they have some particular object in view. They are more frequently found on the shores fishing, or in the woods seeking nests, opossums, bandicoots, or kangaroos. When they are successful, they instantly make a fire, and eat a portion of their game. The married men generally reserve a share for their wives. They are extremely jealous of their food, concealing and eating it silently and secretly; yet if others are present they usually give a small portion: they tell me that one-half of what they procure they eat and divide with their companions, and the remainder they keep for the night. The men also collect roots, and sometimes *challows*, but for these they chiefly rely upon their wives. I have imagined that the classes called *Erniung* and *Tāā-mun* keep themselves more separate.

They have some superstitious notions in regard to peculiar food for different ages and sexes. Thus girls, after eleven or twelve years of age, seldom eat bandicoots, such food being considered a preventive to breeding; young men will not eat *nailoits* or *war-lits* (black eagle), or they will not have a fine beard: such food will also influence their success in the chase; and although kangaroos may abound, they will seldom see them, and always miss them when they attempt to spear them. I believe that it is not until the age of thirty that they may eat indiscriminately.

Quails (*pourriock* or *pourrha*) are old men's diet. Plenty of kangaroo is supposed to occasion the women to breed.

Of their children they appear to be very fond, and rarely chastise them; but their treatment of the women is not always gentle, and many of them have spear-wounds in the legs or thighs, inflicted by their husbands.

The women are very useful to them, not only in procuring food, but also in preparing their cloaks, building their huts, and other menial offices. They possess few utensils, and those are of the rudest construction: a piece of soft bark, tied at each end, serves for a drinking-cup; the claw of a kangaroo they use for a needle; and through a hollow rush, or the wing-bone of a bird (*nweil*), they suck the water, when it cannot conveniently be reached with their mouths.

Polygamy is a general practice amongst them, one man sometimes having many wives. Their customs, however, as regards their women, are not only very curious, but also so intricate, and involved in so many apparent contradictions and singularities, that it is probable we have been mistaken in some of them.

The whole body of the natives are divided into two classes,

Erniung and *Tem* or *Tāāman*; and the chief regulation is, that these classes must intermarry, that is, an *Erniung* with a *Tāāman*. Those who infringe this rule are called *Yuredangers*, and are subject to very severe punishment. The children always follow the denomination of the mother. Thus, a man who is *Erniung* will have all his children *Tāāman*; but his sister's children will be *Erniungs*. This practice is common to all the tribes in the neighbourhood, with the exception of the *Murram*.

The girls appear to be at the disposal of their father, and are generally bespoke in their infancy: even before they are born we have been told to whom they were betrothed, if they prove to be females.

There appear to be some peculiar regulations here, but what they are we could not ascertain. In some instances it happens that the exchange is mutual. The persons to whom the girls are betrothed are not unfrequently men of the middle or an advanced age, and possessing already several wives. They are, however, often more equally matched.

Another custom amongst them is called *cotertie*: it is confined to boys, and I would compare it to our godfathers; for it seems to be a promise of protection and assistance, and also adopting the boy as a son-in-law.

I do not think they have any nuptial ceremony. At a very early age the girl is brought to her future husband. Attentions and presents are paid more to her father than herself; and, indeed, the trifles she receives are generally transferred to him: these chiefly consist of game, or other articles of food; the father, perhaps, receives a cloak, spears, or other implements. At the age of eleven or twelve years the girl is delivered over to her husband. When a girl is thus, as it were, purchased from her father, the husband is said to be *Parn Yockar*. Those who steal their wives—a common practice amongst them—are compelled to pay more attention to the female. Sometimes violence is used, and the girl is carried off against her consent; generally, however, in these cases the female is the wife of some old man, and the young couple elope by mutual inclination; even the tribe sometimes are privy to the circumstance. For some time the parties keep aloof, and in the first instance go as far away as possible, and continually change their residence, not daring to show themselves amongst the friends of the injured husband, who makes use of every exertion to recover his wife and revenge the insult. Should the parties evade pursuit, and live together until the female becomes pregnant, mutual friends intercede, presents are made to the husband, and she is released from her first engagement. Thus, running away with a wife is called *marr-in-colata*. It most frequently happens, however, that the lady is recovered, when she is punished

by a severe beating, or more frequently by spearing her through the thigh.

Infidelity is by no means uncommon. The husband keeps a jealous eye on his wife, and on the least excuse for suspicion she is severely punished. The majority of the men are single until past thirty years of age; some much longer. The old men have not only several wives, but of all ages.

This state of things is in some measure compensated by what is called *tarramanaccarack*: it is, in fact, courting a wife whilst her husband is living, upon the understanding with both parties that she is to be the wife of the lover after the death of the husband. The presents in this case are made to the husband, as well as to the woman; but what she receives she generally divides with him. This practice is done openly, and permitted; but it must be carried on in so decorous a manner as not to occasion scandal to the parties, or jealousy to the husband.

When a man dies, it is usual for his younger wives to reside with their fathers' tribe during the period of mourning, at which time they receive little attention from the men to whom they are subsequently to belong, and would meet with severe punishment were they to go and live with them immediately. Should the parties, however, subsequently run away, not much notice would be taken. It is not unfrequent for the wife to descend among the nearest relatives of her husband; and this arrangement is well understood during his life.

Like other savage tribes, the women suffer little from child-bearing, and even the next day walk out to seek their food as usual. The period of infancy is divided by them into many stages, the names of which I do not recollect. For the first few weeks the child is carried on the left arm in a fold of the cloak, but subsequently is suspended on the shoulders. Until they can run alone they are not clothed. In cases of twins, one of the children is killed; (if of different sexes, the female being preserved;) the reasons assigned for which measure are, that a woman has not sufficient milk for two children, and cannot carry them and seek her food. They suckle them until they are four or five years of age; but long before they are weaned they are instructed in procuring a portion of their food.

A girl of nine or ten years of age has the superintendence of all the little ones who can walk; and she takes them out each with its stick to dig roots in the neighbourhood of their encampment. Should they espy a stranger, they instantly conceal themselves in the herbage, lying as close as a hare in its form. As they get older they accompany the women, and are generally carried astride on their shoulders.

Their dances have been frequently exhibited to us in the settle-

ment for our amusement. They usually strip themselves entirely; but when before us they had their cloak fastened round their loins, leaving only the upper part of the body exposed. The face was painted red; and on the arms and body were various figures, painted with a white colour. White pigment is usually an emblem of mourning, but it is used in the dances, from its being the most conspicuous colour at night. Their *mulgarradocks* (doctors) and old men never dance.

A fire is kindled on a clear spot, behind which is seated an old man, and in front the dance is performed, as if towards him. They keep the same step, which is varied from time to time; sometimes stooping and grunting, and moving their heads sideways, in most grotesque attitudes.

I think their dances vary, and are in some instances intended to represent the chase and killing of animals; for at times during the dance they cry out *warre, wait, toort*, &c. Whilst they are dancing they have green boughs in their hands, which they in turn advance and deposit with the old man behind the fire. At some of their dances they have their spears, and at a certain part represent killing one of their party; after which the spears are, like the green boughs, delivered to the old man, who the whole time is seated on the ground, looking very serious, and turning his head about as if to inspect and give directions to the dancers, and pulling or stroking his beard with either hand alternately.

There is neither elegance nor activity displayed in their dancing; on the contrary, it is ludicrous, and may be symbolical. I do not think the women dance with the men, nor am I certain that they ever dance, although some of the natives have informed me they do at their own fires. The noise made by them whilst dancing cannot be considered as musical, or intended as such. Each man repeats at every jump the words *wow wow*, the meaning of which I cannot explain. When they drive game from a covert with sticks and a noise, they call it *wow-e-niä-tur*, the word *wow* being also then used. At intervals they stop to rest, at the time setting up a loud shout.

These dances only take place when many are congregated together and at peace. During war it would subject them to an attack from their enemy, by exposing the situation of their encampment.

Upon the first formation of the settlement we endeavoured to discover whether they had any chiefs, and for a long time believed they had; indeed, we had fixed upon two or three individuals to whom we supposed that rank belonged. The natives whom we had selected were fine, tall, active men, much painted and ornamented. Their names were *Naikennon*, *Gnewitt*, *Wurti*, and *Eringool*; but we subsequently discovered that they were all single

men, which accounted for their constantly ornamented appearance. The influence they held over the rest of the natives might have arisen from other circumstances; and we could not discover any individual to whom they gave the supremacy. *Nuikennon*, however, gave out for some time that he was king and captain of the black men. It was a long time before he could be persuaded to visit us, and when he came he was formally introduced by his companions, who talked much about him, and seemed to consider him as superior to them. He was one of the finest looking and best limbed men amongst them, wore his hair tied up in a knob behind, bound tightly round with a string, and his head ornamented on the top with a tuft of white feathers, and a similar badge round his left arm. His chest and shoulders were very much marked with gashes (*umbin*), and there was much peculiarity in his manners. He talked little, very rarely asked for anything, and, for a great length of time, would neither accompany us on our sporting excursions, nor otherwise render us the little assistance that we were in the habit of receiving from others of his tribe. After a little time, however, both he and his brother, *Mawcurrie*, became more sociable; and, at last, so partial to our people, as seldom to leave the camp. We had, therefore, a fair opportunity of satisfying ourselves that neither of them possessed any authority over their countrymen.

The individuals who possess most influence are the *mulgarradocks*, or doctors. Of these they have several grades, differing very materially in the nature and extent of their power, which, like other savages, they attribute to supernatural agency.

A *mulgarraddock* is considered to possess the power of driving away wind or rain, as well as bringing down lightning or disease upon any object of their or others' hatred. In attempting to drive away a storm of rain, they stand out in the open air, tossing their arms, shaking their clothes, and making violent gesticulations, which they continue for a long time, with intervals, if they are not successful. Almost the same process is used to remove disease; but in this case they are less noisy, and make use of friction, sometimes with green twigs, previously warmed at the fire, frequently making a short puff as if to blow away the pain.

The hand of the *mulgarraddock* is also supposed to confer strength or dexterity, and the natives frequently apply to them for that purpose. The operation consists in simply drawing his hand repeatedly, with a firm pressure, from the shoulder downwards to the fingers, which he afterwards extends until the joints crack.

They do not, however, use friction indiscriminately. In cases of dysentery, for example, to which they are very subject, they administer to the patient the gum of the grass-tree, and sometimes the green stems of the *meernes* (the red root before mentioned).

They have probably many other remedies, for they seem partial to medicines, and will swallow the most nauseous dose to the dregs. The complaints to which they are most subject are those arising from cold, sore throat, and bowel complaints, which are frequently terminated by death, particularly with children.

A young man, standing one day by my fire apparently in good health, fell suddenly on his face senseless, with convulsive twitchings of the face, neck, and arms. I raised him up, and after a few minutes he recovered, and requested I would give him medicine. He told me that such attacks were not uncommon, and wished much to know if we were subject to them. I have seen very few cases of eruptions or boils. Instances of deafness and blindness sometimes occur, but are not common. On the whole they appear to have few ailments. The practice of the *mulgaradocks* is principally confined to the cure of spear wounds, to which, indeed, comparatively little attention is paid by them. They are very skilful in extracting the weapon, after which they apply a little dust, similar to what is used for pigment, and then bind the wound up tightly with soft bark. In the diet of the sick, however, they are very particular, and the stages of convalescence are marked by the food which they are permitted to eat. At first, roots only are allowed, afterwards lizards, then fish, &c. No cases of deformity have been observed amongst them. Fainting occasions no alarm. They once saw some of our people in a state of inebriety, one of them quite unable to stand; upon which they came to me in great alarm, under strong apprehension that he would certainly die before the following day; adding that black men were sometimes taken so and died. I endeavoured to ascertain the nature of the disease, and think they must have meant a *coup de soleil*.

The treatment they adopt for the bite of a snake is simple and rational. They tie a ligature of rushes above the part, enlarge the wound with the claw of the kangaroo or the point of a spear, and then suck it, washing it and their mouths frequently with water. Where water cannot be procured, it is considered dangerous to suck the wound. One of the natives (*Wannua*) was bitten on the finger, and lay ill for a day or two, and some time afterwards appeared thin and unhealthy.

With respect to the divisions and subdivisions of tribes, there exists so much intricacy, that it will be long before it can be understood. The classes *Erniung* and *Tem* are universal near the Sound; but the distinctions are general, not tribal. Another division, almost as general, is into *Moncalon* and *Torndirrup*; yet there are a few who are neither. These can scarcely be distinguished as tribes, and are very much intermingled. The *Moncalon*, however, is more prevalent to the eastward of our establishment,

and the *Torndirrup* to the westward. They intermarry, and have each again their subdivisional distinctions, some of which are peculiar, and some general; of these are the *Opperheip*, *Cambien*, *Mahnur*, &c.

What I, however, consider more correctly as tribes, are those which have a general name and a general district, although they may consist of *Torndirrup* or *Moncalon*, separate or commingled. These are, I believe, in some measure named by the kind of game or food found most abundant in the district. The inhabitants of the Sound and its immediate vicinity are called *Meanager*, probably derived from *mearn*, the red root above mentioned (p. 36) and *anger*, to eat. It is in this district that the *mearn* is the most abundantly found; but distant tribes will not eat the *mearn*, and complain much of the brushy nature of the country*—that it scratches their legs. Kangaroos of the larger sort are scarce here, but the small brush kangaroo is plentiful, and grass-trees and *Banksia* are abundant, as is also, in the proper season, fish.

The natives residing on the right, and extending to the coast about North-West Cape, are called *Murram*. This country, or district, is said to be more fertile, and produces different kinds of edible roots. It affords also more ponds of water, more wild fowl, and more emus.

These tribes are also not universally divided into *Erniung* and *Tem*, and frequently infringe the rule. Adjoining them, inland, is the *Yobberore*. This country appears more hilly and better wooded; but we have had very little intercourse with the natives who belong to it. Next to them is the *Will* or *Weil* district, which is a very favourite country, and may probably be named from *Weil* or *Weit* (ants' eggs). In this country they mention the existence of a river which is large and deep, extends beyond their knowledge, and is only to be crossed at one spot, over a large fallen tree.

Next to the *Weil* district is that of *Warrangle* or *Warranger*, from *warre* (kangaroo), and seems to be of the same character as the *Weil*, which is chiefly open forest land, with a little short grass, and abounding in kangaroos, opossums, and other animals, as well as many birds, which are not found near the coast.

The *Corine* district—the name of which may be derived from *qūur* (which I believe to be the bush kangaroo), an animal I have never seen—is said to be very open and nearly free from wood, to have much fern growing about it, and several large salt-water lakes. Beyond the *Corine* is a river which, however, is fordable; it falls into the sea.

* It may be inferred, therefore, that the interior is more open and the land of better quality; for poor soils are always covered with a scrubby brush, and quite useless for the purpose either of depasturage or cultivation.—P. P. K.

Although every individual would immediately announce to us his tribal name and country, yet we have not been enabled to trace any regular order of descent. The son follows his mother as *Erniung* or *Tem*, and his father as *Torndirrup* or *Moncalon*. Beyond this we have not been able to penetrate, for half brothers are not unfrequently different. This would probably be caused by cross marriages. From the same cause also their divisions of relationship are very numerous. *Eicher*, mother; *cuinkur*, father; *mourert*, brother or sister; *konk* or *conk*, uncle, &c. &c.

In their marriage, they have no restriction as to tribe; but it is considered best to procure a wife from the greatest distance possible. The sons will have a right to hunt in the country from whence the mother is brought.

They are very jealous as to encroachments on their property, and the land is divided into districts, which is the property of families or individuals. At some particular seasons of the year, however, the young men visit their neighbours in parties, and sometimes travel forty or fifty miles for that purpose. Their stay, which is generally short, is a period of rejoicing and feasting.

The visiting, of course, only takes place between friendly parties, yet it is attended with a ceremony denoting peace; and they generally approach their friends a little previous, or subsequent to noonday.

It once occurred to me to be out shooting, accompanied by Mawcurrie, the native before spoken of, and five or six of his tribe, when we heard the cry *coo-whie*, *coō-whie-cā-cā*, upon which my companion stopped short, and said that strange black men were coming, and were 'no good,' and wished me to accompany him to attack them. Very soon afterwards, however, he discovered that they were friends, and we walked towards them. They were five or six of the *Murram* tribe, and were dancing along the path towards us.

Their spears and *mearas*, or throwing-sticks, were carried by one man; the rest were unarmed. They were painted and greased all over, and each had a band round his forehead, in which was stuck grass-tree leaves, hanging downwards over the face. Each also carried in his hand a green bough.

On meeting, they made several turns in a circular direction, and then severally embraced, by encircling the waist of their friend with their arms, and lifting him from the ground, kissing hands, &c., all of which was invariably returned. The dancing was then renewed, and continued at intervals, after which I left them to themselves. The green twig appears always to be an indication of peace, and is much used at their dances.

When individuals quarrel with each other, it is taken up by the respective families.

When a man is killed, his tribe instantly sets about revenging his death; but they are not particular whether they kill the principal offender or any other of his tribe. This feeling of retaliation is, however, extended much farther, for if a man be killed by accident, by falling from a tree, drowned in the sea, or any other way, the friends of the deceased will impute his death to some *mulgarraddock* of an adverse tribe, and kill an individual belonging to it in retaliation. Also, when a man is seriously ill, and fancies he shall not recover, he will attempt to kill somebody, in hopes thereby of recovering.

In their personal conflicts they use their hammers, throwing-sticks and *towks* to strike with, and the blows therewith inflicted would doubtless frequently be fatal; but they seem incapable of giving a heavy blow, and strike more like women. They do not use shields, but are extremely dexterous in avoiding the spear.

Their quarrels most frequently arise about their women. For depredations on each other's ground, or any slight cause, they are contented with spearing through the legs or thighs, and do not attempt to kill each other; and the moment one of the party is wounded, the engagement ceases.

In some parts of Australia they have regular war meetings for the purpose of fighting, but this is not the case at King George's Sound. Their attacks, when intended to be fatal, are most frequently made at night, and always by stealth. We have more than once witnessed their common rencontres. As soon as the enemy is seen approaching, a shout or scream is set up, and all hasten, armed with their spears, to the spot, approaching them with loud noise, thrusting their beards in their mouths, and making the most hideous grimaces, so that they look as if they were frantic. It seldom happens that more than one or two of each party engages; and during the conflict, the rest frequently endeavour to separate the combatants, so that there is much running about. They throw their spears, standing only a few paces from each other; and their dexterity in avoiding them is really wonderful, although they seldom move from the spot, so that many spears are frequently thrown before one of either party is injured.

During the time of war they either quit their locations and go to distant places, for the safety of the women and children, or else assemble together in great numbers for mutual protection. At these times they seldom kindle a fire, except to cook their food, and very frequently remove their encampment, and use every other precaution for concealment. The single men are most frequently the warriors or the attacking parties. They travel in small detachments of three or four together, and endeavour to leave as little trace of their march as possible, avoiding the regular

paths, lest their footsteps be discovered ; for, like other savages, the Australians are wonderfully sagacious in tracking by the impressions of the foot. Upon discovering the encampment of their enemies, they wait till night, and then cautiously approach, by creeping on their hands and knees, until they have selected the person they are in search of, and immediately spear him through the body. The party who are thus surprised will instantly fly, without attempting resistance ; for during the darkness of the night they cannot discern their friends from a foe, and the light of their fires serves to expose them to the spears of their enemies.

Women and children are alike sacrificed, but we seldom heard of more than one individual being killed at an attack. They are, however, so constantly at war that their numbers must be considerably diminished by it. When an individual falls, there are always some who take upon themselves to revenge his death.

Immediately after the burial, the encampment is broken up, and they quit the neighbourhood for a period, during which time they are cautious not to utter the name of the deceased ; and in relating the occurrence, the names of the survivors are alone mentioned, and by the omission of that of the dead his fate is told. Upon inquiring into the cause of this custom, they say it is not good to speak his name, lest they should see his *gnoit* or ghost.

Their funeral solemnities are accompanied by loud lamentations. A grave is dug about four feet long and three wide, and perhaps a yard in depth. The earth that is removed is arranged on one side of the grave in the form of a crescent ; at the bottom is placed some bark, and then small green boughs, and upon this the body, ornamented and enveloped in its cloak, with the knees bent up to the breast, and the arms crossed. Over the body is heaped more green boughs, and bark, and the hole is then filled with earth. Green boughs are placed over the earth, and upon them are deposited the spears, knife, and hammer of the deceased, together with the ornaments that belonged to him ; his throwing-stick on one side, and the curl or towk on the other side of the mound. The mourners then carve circles in the bark of the trees that grow near the grave, at the height of six or seven feet from the ground ; and lastly, making a small fire in front, they gather small boughs, and carefully brush away any portions of the earth that may adhere to them. The face is coloured black or white, laid on in blotches across the forehead, round the temples, and down the cheek-bones, and these marks of mourning are worn for a considerable time. They also cut the end of the nose, and scratch it, for the purpose of producing tears. During the period of the mourning they wear no ornaments or feathers. It frequently occurs that two individuals bear the same name, and in this case,

should one of them die, the other changes his name for a certain period, in order that the name of the deceased should not be uttered.

When a female is interred, her implements are, in like manner, deposited in her grave.

From this trait it would be natural to suppose, that they have a belief of a future state; and I think it cannot be doubted that they have. They have very readily adopted an idea which was held out to them, that after death they would go to the moon; but I do not think this was their prior opinion, for in reply to my inquiry, 'where their fathers had gone?' they pointed westward.

They believe in ghosts, and some will assert that they have seen them. I once showed a boy an anatomical drawing of a full figure, upon which he immediately exclaimed that it was a *gnoit*; and some of them who had once obtained a glimpse of the drawing, could not be persuaded to look upon it again. They are also very superstitious as regards omens; the noise of the night-cuckoo is supposed by them to portend death.

Of their language we have, as yet, little knowledge; the vocabulary will show that it abounds in vowels, and is by no means wanting in harmony. It differs entirely from that of the natives of the eastern coast; and even tribes very nearly situated differ so considerably, that I do not think at two hundred miles they would at all understand each other. They generally speak rapidly; and when in conversation, not unfrequently break out into a kind of chant, in which they relate such occurrences as at the moment interest them. They have, however, singing, if not songs, among them, perhaps entirely extempore. Their women more frequently sing while by themselves, and their songs are not always decent: they are also said by the men to be very fluent in abuse; and their oratory, as interpreted to us, was sufficiently *piquante*. At their camps there was always a great noise, but it instantly ceased on the approach of a stranger, till it was ascertained who he was. They seemed at times very merry and good-tempered; had much fawning and flattery: at first they commenced pilfering, but for a length of time depredations were very rare, and numerous articles stolen by strangers were returned.

VOCABULARY.

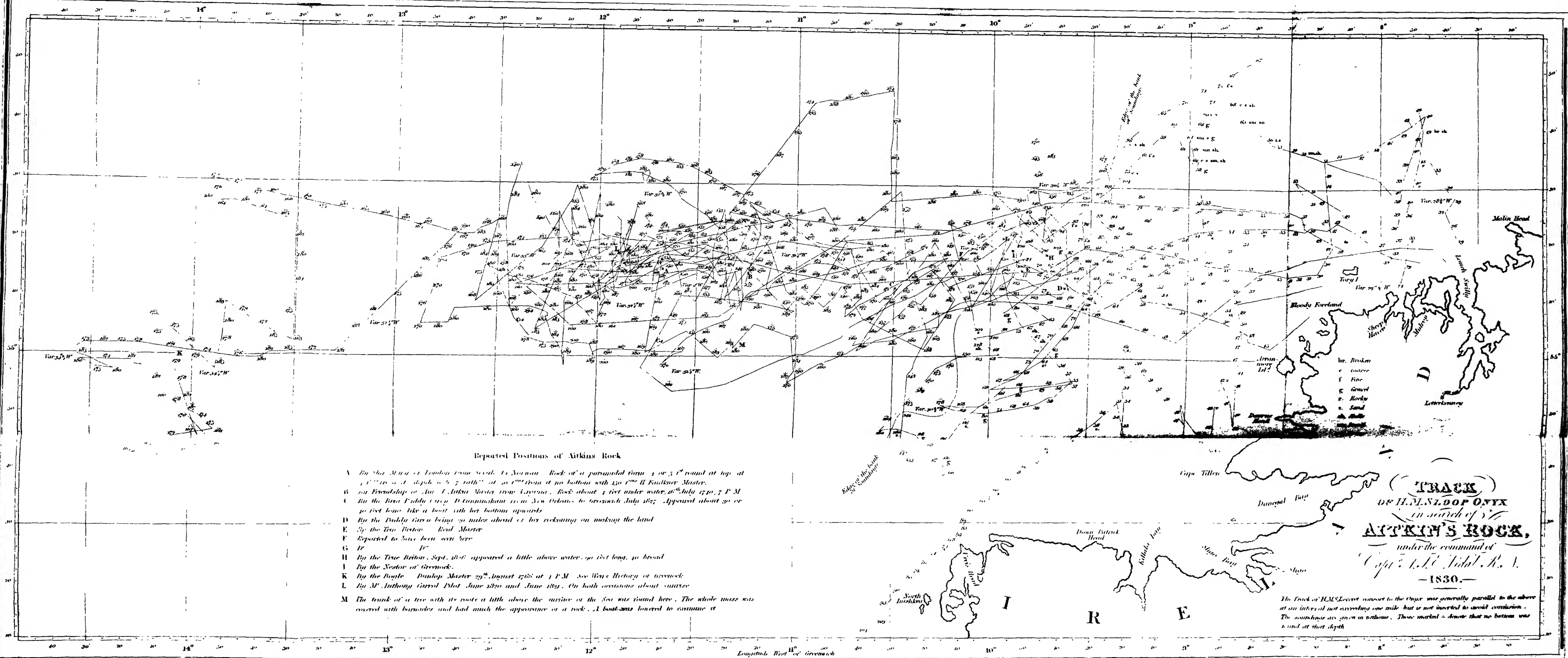
Head	Kāāt	Throat	Woort
Eyes	Meāl	Ear	Twank
Nose	Chungulet	Beard	Narnac
Mouth	Tāā	Breast	Pēēp
Teeth	Orlock	Belly	Corpul
Tongue	Tarlin	Hand	Marr

Foot	Māāt, or Chen	I want bread	{ Quannert un gee, or Marrin un gee
Thigh	Towl	I want badly	Urelibup un gee
Hair	Chow	Water to drink	Kaip un āān
Skin	Mawp	To eat	Anger, Tāā
Liver	Māierr	Bread	{ Quannert, or Marrin
Body, or Flesh	Yarlin	Rice	Kioc
Bones	Queet	Potato	Yoke*
Smell	Tāāmil	Absent, At a distance	{ Bōcun
Fat	Cheerung	Let us go away	{ Bōcun oola, or Wat-oola
Cloak	Poāāk	Path	Māāt
Girdle	Noodlebull	Long	Woorie
Tuft of feathers worn on the head	{ Wallowinny, or Caccalon	Short	Korert
String round the throat	{ Woortil	Much or large	Orpern
Knife	Tāāp	Little	Nehp, Nehbitur
Hunting spear	Keit	What, What do you say?	{ E Nāāw
Throwing stick	Mēar	What is your name?	{ Enoc eēan
Short stick	Towk	Bad, Unfit to eat	Wockun
Curled stick, or Bomerang of Sydney	{ Curl	Good	Quaup
Hammer	Koit	This	Nē
Wing-bone of a bird, used to suck water through	{ Knweel, or Nweel	To steal	Quypul
String	Peteroe	Thief	Quypungur
Yes	Hōō, Ky, Quāco	Likethis, In this way	{ Ky unera
No	Poort	Night	Kartiac
Don't	Pal-Pal	Day	Ben, Bennan
I cannot	Un Waumb	Star	Chindy
I'll go away	Un Bourloc	Moon	Meuc
Come	Ca	Sun	Chāāt
Come here	Ca wa, U-alla	Thunder	Condernore
Go away, be off	Bullocō	Lightning	Yerdivernan
Yours	Nuneloc	Morning	Mania
Me or mine	Un	To morrow	Maniana
I am hungry	Un Urelip	Yesterday	Kartiac kain
I am full	Un Mourert	Bye-and-bye	Poordel
I want	Un Gee	Just now	Yibbal
		Some time since	Corram

* The above names, strictly, indicate vegetable substances resembling the articles of food expressed, and thence applied to them as they became known. The root *quannert*, or *marrin*, (bread,) is probably a gigantic truffle.

Long while since	Corram quatchet				{ Tiajip
Evening	Corramellon				{ Bernanore
Cold	Mulgàn	Parrots			{ Towern
Hot or warm	{ Ureler				{ Teer
weather		Hawk			{ Corriore
Young	Eeniung, Tooting	Night Cuckoo			{ Combiac
Sleep	Copil	Snakes			{ Norne
Sleep together	Copil nahluc	— Diamond			{ Docat
Listen	Yuccan	— Lizards, Short			{ Wackul
		— Long-tailed			{ Youern
Hut	Toorloit	— Guana			{ Wandy
Wood	Poorne				{ Munnaar
Honeysuckle	Moncat				{ Meerne
Grass-tree	Paaluc				{ Tuboc
Gum of grass-	{ Perin	Roots eaten			{ Chocket
tree					{ Caumuck
Land	Moorile	Rush			{ Paat
Earth	Yahl	Grass			{ Challup
Sand	Til	Crawfish			{ Challow
Large Ant-hill	Weet, or Weetuch	Fresh-water			{ Kilon
Stone	Pwoy	Tortoise			{ Pooye
Sea	Mammord	Eggs			{ Pooyiore
River	Peerle	Hen, laying			{ Naank
Lake	Penger	Hens of Birds			{ Māam
Flint	{ Pal, Tockil,	Males			{ Cry or Call of
	{ Coorder	Birds			{ Mai
Feathers	Keardit	Seal			{ Barlard
Bird	Keard	Whale			{ Mammang
Macaw	Noorlark	Shark			{ Martiat
Black Cockatoo	Curraak	Fish			{ Wallah
White ditto	Munnit	Quail			{ Pooriock
Bronze Pigeon	Moorhait				
Emu	Wait	Noisy, Scolding			{ Wanker wanker,
Kangaroo	{ Warre, fem.				{ Yanger yanger
	{ Yungur, male	Serious			{ Mennem
	{ Nailoit	Falsehood			{ Purtup
Other varieties	{ Wahl	Hurt or Sore			{ Baruck
	{ Tāamur	Ill			{ Mendeit
	{ Quakur	Well			{ Toortock
Bandicoot	Quernd	Laugh			{ Cowker
Dog	Toort	Playful, Joking			{ Wimberner
Opossum	Comal	One who talks			{ Mai a poole
Ring-tail ditto	Nworra	much			{ Twank ā toot
Duck	{ Wackerren	Deaf			{ Neent
	{ Wainern	Tail			{ Peet
Musk Duck	Coatchuck	Sinews			{ Keepiuc chāanuc
Black Swan	Marlie	Dead and buried			{ Yahluc
Eagle	Warlit	Buried			

Fire	Carle		<i>Winds.</i>
Cooked	Tokenor		
Hot	Carloc	S.W.	Bernang
Plenty	Carle nent	N.	Cheeriung
Wild Dog	Yaccan toort	E.	Yerlimber
A Ghost	Noit	S.	Meernan
		N.W.	Woortit
A Man	{ Yungur. Also a male kangaroo	One	Kain
Woman	Yock	Two	Cojine
Young and pretty	Yock prindy	Three	Tāan
Old man	Narnaccarack	Four	Orre
Middle aged	{ Narnacpool— full bearded	Five	Poole
Young man	{ Narnactowaller— beard growing	A few	Kain kain
Youth	{ Narnac poort — no beard	Many	Poole, or Orpern
Boy	Coolon		<i>Names of Tribes.</i>
Girl	Wainernung	Mearn-anger	Warrangle
Infant at breast	Peep anger	Murram	Weil
Pregnant	Corpullel	Yobberore	Corine
Married man	Yock a duck		
Single man	Manjahly		<i>Classes.</i>
Doctor	Mulgarradock	Erniung	Tāa man, or Tem.
Blacks	Mohurn		
Whites	{ Torndiller, or Maupern ner- ran nerran	Moncalon	Torndirrup
Father	Cuinkur		
Mother	Eecher	Obberup	Cambien
Mother of many	Eecher poole		Mahnur
Barren	{ Eecher poort, Padjee wernung		<i>Names of Men.</i>
Moonshine	Meuc cong	Weeburn	Naikennon
Full moon	Copperrn	Meindert	Mawcurrie
Other stages	{ Wern a warra Kuit a weet Moreuc	Wongar	Eringool
		Murrinan	Ninderowl
		Cowerole	Toolingat Wally
		Wallingool	Tāāton
		Manquenar	Nourtuckeen
		Wong	Woorungoorit
		Tarragan	Mongicre
		Wowenur	Parteit
		Youredill	Dalwin
		Colbum	Corapan
		Yettit	Wannua
		Wernton	Nandobert
		Mohun	Pandure
<i>Seasons, beginning with June and July, or Winter.</i>			
	Mawkur		
	Meerningal		
	Maungernan		
	Beruc		
	Meertilluc		
	Pournur		



Reported Positions of Atkin's Rock

- A By the *Star of England* from South to North. Rock of a pyramidal form 4 or 5 ft round at top at 1 fathoms depth 6 or 7 fathoms at 30 fathoms from it no bottom with 150 fathoms of Foulkner Master.
- B By the *Friendship* of John T. Atkins Master from Liverpool. Rock about 4 feet under water, 10th July 1790, 7 P.M.
- C By the *First Paddy* Capt. D. Cunningham in the New Orleans to Greenwich July 1827. Appeared about 30 or 40 feet long like a boat with her bottom upwards.
- D By the *Paddy* Green being 30 miles ahead of her reckoning on making the land.
- E By the *True Briton* Read Master.
- F Reported to have been seen here.
- G By the *True Briton*.
- H By the *True Briton*, Sept. 1846. appeared a little above water, 40 feet long, 10 broad.
- I By the *Sector* of Greenwich.
- K By the *Boyle* Dunlop Master 29th August 1786 at 1 P.M. See *Ways History* of Greenwich.
- L By the *Anthony* Corvet Pilot June 1820 and June 1829. On both occasions about sunrise.
- M The trunk of a tree with its roots a little above the surface of the sea was found here. The whole mass was covered with barnacles and had much the appearance of a rock. A boat was lowered to examine it.

(TRACK)
OF H.M.S. SLOOP ONYX
in search of
ATKIN'S ROCK,
under the command of
Capt. J. J. Liddell, R.N.
—1830.—

The track of H.M.S. *Onyx* in search of the above is generally parallel to the shore at an interval not exceeding one mile but is not inserted to avoid confusion. The soundings are given in fathoms. Those marked with a dot denote that no bottom was found at that depth.

<i>Names of Women.</i>		<i>Names of Places.</i>	
Pæania	Courtingait	Corjurnurruf	Chungernup
Nockolock	Neerwangle	Toccillirrup	Yangiuc
Tittipan	Yinovert	Morrillup	Yaccun Yattap
Nandewait	Chockobert	Obar	Borringorrupt
Pæalol	Mongarwort	Marliore	Warlit Mai
Quannettin	Peipinbert	Yaowerilly	Peehirt
Kartovert			

IV.—*On the Vigia called the Aitkins' Rock.* By Captain A. T. E. Vidal, R. N. Read the 13th of December, 1830.

OF the numerous vigias dispersed over the North Atlantic Ocean, not one has perhaps excited so much apprehension, or been the subject of such frequent inquiry, as that denominated Aitkins' Rock. It is said to lie off the north-west coast of Ireland, immediately in the track of vessels trading from the westward to our northern ports; and the various positions assigned to it range from the latitude of 55° to $55^{\circ} 18' N.$, and from longitude $9^{\circ} 38'$ to $14^{\circ} W.$

The first notice of this supposed danger was communicated from Whitehaven on the 12th September, 1740. It states, 'that on the 15th July last, at seven o'clock at night, on our passage from Virginia, in the Friendship of Ayr, John Aitkins, master, James Lockhart, mate, saw, by the weather-leech of our foresail, a rock about four feet under water, distant, to the best of our judgment, forty or fifty yards. Our ship was running E. by S., under a reefed foresail, at the rate of six knots per hour. The wind was N.N.W., with a heavy swell from the N.W. All hands were on deck, and saw it plainly. Next morning, we made the land between Inishterhol and Tory Island, at about eight o'clock; and at noon the Mouth of Derry Loch bore S.W. by S. ten leagues, Isla at the same time being E. by S. six leagues. From these bearings, I find the rock lies in latitude $55^{\circ} 18' N.$, and longitude, from the meridian of London, $11^{\circ} 14' W.$ At the time we saw the said rock it was an hour's ebb.'

Secondly.—In Wein's History of Greenock, amongst the occurrences of the year, we read—'September 4th, 1766.—The accounts we had formerly from Captain Aitkins are confirmed by Captain Dunlop of the Bogle, who arrived this day from Virginia, and gives the following account:—

'On the 29th ult., about four P.M., we fell in with a small rock, bearing north one quarter of a mile distant. We were then sixty leagues west of Tilling Head, on the north-west coast of Ireland. Its top was rugged, and about the length of the ship's keel, and appeared seven or eight feet above water. By

' an observation that day at noon we made its latitude exactly 55° .
 ' The wind was blowing a brisk gale at W.N.W., and the vessel
 ' going at the rate of seven knots. When we lost sight of the
 ' rock, which was in twenty minutes, it bore N.W. by W. about
 ' two miles and a half.'

Thirdly.—' The ship Nestor of Greenock, returning from New
 ' York in 1793, being in latitude $55^{\circ} 19'$ N., and longitude, per
 ' account, $9^{\circ} 53'$ W. of London, the officers, passengers, and ship's
 ' company who were then on deck, perceived a rock about four
 ' feet below the surface of the water, and not five fathoms from
 ' the weather-beam of the ship. It was in the form of a horse-
 ' shoe, with one side longer than the other. The mate instantly
 ' threw an empty barrel overboard. The yawl was got out as
 ' soon as possible, and the mate, four of the crew, and two
 ' passengers, went in the boat, and were absent nearly two hours
 ' in search of the rock; but owing to the ship's drift, and a dark
 ' cloud which then obscured the atmosphere, they could neither
 ' find rock nor barrel. The Rev. Mr. Stewart was then a pas-
 ' senger in the Nestor, and saw the rock plainly, with the tangle
 ' growing on it.'

Fourthly.—In the Greenock Advertiser was given an extract
 from a letter of Mr. Hugh Faulknor, master of the ship Mary of
 London, stating that, on his passage from Seville to Bergen in
 Norway, he perceived close by him the appearance of a rock to
 leeward, and, from light winds, had some difficulty in weathering
 it. When past it, he hoisted out his boat, put some hands into
 her, with a deep-sea lead and line; and it being then calm,
 sounded all round it. At the distance of four fathoms from it, he
 had from thirty-five to forty feet, and at thirty fathoms' distance, no
 bottom, with a hundred and fifty fathoms. It was of a pyramidal
 form, nowise rugged, but perfectly smooth as far as could be
 seen below water, and not exceeding four or five feet round at the
 top, then appearing like a boat three or four feet above water. He
 had at the same time a good observation close by the said rock,
 and proved it to be in latitude $55^{\circ} 15'$ N., and longitude $11^{\circ} 40'$
 W. From the landfall made (being the north of Lewis) exactly
 corresponding with his reckoning, he has no doubt but his longi-
 tude given is correct. Mr. Faulknor adds—' In 1772 I sailed
 ' with Captain Hugh Moody, and heard him say, that in 1770 or
 ' 71, in the brig Nancy of Greenock, he fell in with Aitkins'
 ' Rock, and went with a boat and sounded it. At the distance of
 ' a boat's length, had from thirty to forty fathoms; that it was
 ' small above, and rather below the level of the sea, as near as he
 ' could judge from the water washing over it.'

Fifthly.—An extract from the log-book of the True Briton, James
 Reid, master, informs us, ' that on Wednesday, 27th September,

' 1826, when steering E.S.E., a man at the mast-head called out that there were breakers close to us on the starboard bow. I immediately hauled the brig up, S.S.E., to clear them. In the run of the sea, a rock appeared a little above water, nearly flat, about ninety feet long and forty broad; saw no breakers except round the rock, but could distinctly see the sea working over it. We sailed from the rock eleven miles S.S.E. by compass, and observed in latitude $55^{\circ} 17' N.$ We then bore up E.S.E. thirty-six miles, and E. by S. six miles, when Tory Island bore by compass S.W. $\frac{1}{2}$ W., distant one mile and a half.'

Sixthly.—In the *Greenock Advertiser* of 30th July, 1827, we read—' In the brig *Paddy Carey*, D. Cunningham, master, on her passage from New Orleans to this port, on Wednesday the 25th inst., while running for the North Channel, at three P.M., Mr. Drain, my mate, called me and said he saw a long-boat bottom up. I ran on deck, and saw the sea roll over it; at the same time it struck me it was Aitkins' Rock, although it did not agree in the latitude by several miles. It appeared, at the north end, smooth, and the south end like the tail of a fish. The sea rolled over it, and in the hollow of the sea it was about two or three feet high, and about thirty or forty feet long. We had all sail set at the time, and were going seven knots: so that we had not much time to examine it. We had an observation the same day in latitude $55^{\circ} 08' N.$, and longitude $12^{\circ} W.$ We ran E. by S. $\frac{1}{2}$ S. fifty miles, E.S.E. fifty, and S.E. by E. ten miles, and made the land of Arranmore at five A.M. on the 26th. We found the vessel had been a-head of her reckoning about thirty miles, and applying this correction it would appear we passed it in latitude $55^{\circ} 12' N.$, and longitude $10^{\circ} 30' W.$ We could not exactly say it was a rock, but think it proper to report the circumstance, as it may be useful to warn mariners of a possible danger.'

Lastly.—Mr. Anthony Carrol, who had a small fishing vessel on the north-west coast of Ireland, and whom we have personally interrogated on this subject, declares to have seen the rock in June, 1820, and again in June, 1821,—on each occasion about sunrise, with light easterly winds and smooth sea. He stated his nearest approach, by estimation, was about three hundred yards. Its top was small—about three feet above water, rising abruptly on the north side, and sloping gradually on the south. There was no surf or break upon it, but merely a ripple of the waters round it. He did not examine it with his boat, neither did he try for soundings anywhere in its vicinity, which he attributes to the superstitious feelings of his people, and his account is altogether vague and unsatisfactory; yet this is one of the living evidences

for its existence. Some few other situations are assigned to it on the chart, but we are unacquainted with their authorities.

Having thus detailed the various accounts which have been received of this vigia, we proceed to state, that in June, 1822, the Chamber of Commerce of Glasgow, addressed a letter to the Admiralty, informing their Lordships, that during the year 1821 no less than six vessels were missing from that port; that of late years several ships had disappeared, and never been heard of; and that a very general opinion was entertained that these losses were occasioned by the Aitkins' Rock. In this view, the Chamber of Commerce requested the Lords of the Admiralty would order some of the cruisers on the Irish station to be sent to seek out and carefully determine the position of this danger, and also to sound and trace to its western limits the great bank which extends from the Hebrides and the north of Ireland. In October, 1826, the Chamber transmitted to the Admiralty the extract from the log-book of the *True Briton*, and took the opportunity to renew the former application; and in August, 1827, it again applied, enclosing the report of the master of the *Paddy Carey*, as fresh grounds for its apprehensions.

In consequence of these representations, instructions were sent to the commander-in-chief on the Irish station; and, in 1824, his Majesty's sloop *Gannet* was ordered on this service; in 1827, the *Harrier* and *Badger*; and in 1829, the *Pylades* and *Despatch*—all with equal ill success: the rock was not discovered.

The Admiralty having resolved to pursue the inquiry in the summer of this year (1830), the *Onyx* and *Leveret*, two ten-gun brigs, commanded by Lieutenants Dawson and Worth, were selected for the duty, and ordered to rendezvous in Loch Swilley, the best and nearest port to the supposed danger. Particular instructions were drawn up by Captain Beaufort, the Admiralty hydrographer, for their method of proceeding in this examination; and the charge of carrying them into execution was committed to Captain Vidal, who was embarked for that purpose on board the *Onyx*, the senior lieutenant's vessel.

On arriving late in May, the errors and rates of the chronometers were ascertained at Buncrana,—the geographical position of which had been previously determined by the Ordnance survey. Preparatory to sailing, the brigs were swung on the different points of the compass to ascertain their local attraction, and such signals added to those in general use as the particular nature of the service rendered necessary. They put to sea on the 6th of June, when the moon was at the full; and, commencing their examination at Tory Island, proceeded nearly along its parallel of latitude to the westward of all the given positions of the rock.

The two vessels were always in company; and the general practice was to sail on parallel lines distant from each other from one mile to one mile and a half by day, and closing at night to half a mile, or as much less as the state of the weather rendered necessary. During the few hours of darkness experienced on the north of Ireland at that season of the year, the vessels were hove to, that no part of the suspected ground might be passed unseen, and the leads were kept going both day and night, from the depth of an hundred and fifty to two hundred fathoms. Their distances from each other were determined every hour by the angle of elevation subtended by their respective masts, at the heads of which balls had been placed to facilitate the measurement. Their mutual bearings were taken at the same time; and men were kept constantly at the mast-heads during the day, and a vigilant look-out preserved through the night.

The parallel of latitude of Tory Island, as already mentioned, was first carefully examined to the westward of all the positions of the rock, and then traversed back again. These runs were laid down on the chart, and then other lines traced, until the whole space was explored as there exhibited. And this system of crossing and recrossing over every part of the suspected ground was persevered in until the 31st of August; when, having visited every position assigned to this danger, and indeed the whole space comprehended by them, without seeing any rock, or discovering any detached bank, which could indicate its having existed, the search was relinquished, and the vessels returned to England.

In addition to the system of cruising above mentioned, the hydrographer, in his instructions, had recommended that the vessels should sweep for the rock by laying out a large scope of hawsers between them, and drifting with it over the suspected ground. To effect this he suggested two methods. The one, when the two vessels should be on the same tack, the leading brig keeping a little off the wind, with her main-topsail occasionally lifting; the hawsers fast to her quarter, with a spring to them from her weather-bow; the sternmost brig lying to, with her main-topsail to the mast, the hawsers from her weather-bow, and a spring to them from her weather-quarter. The other method he proposed was that of drifting on opposite tacks, the hawsers fastened to their sterns, with springs to them from the weather-bow of each vessel.

An additional number of hawsers were accordingly provided for the purpose at Portsmouth; and, upon the principles described, a line of them, amounting to more than fourteen hundred yards, was laid out, and a large portion of the suspected ground subjected to this mode of examination. To prevent the central part of this long scope from descending to too great a depth, and to relieve the vessels and hawsers as much as possible from the strain

required to keep so much heavy rope in proper tension, the hawsers near the middle of the line were buoyed, at intervals, with empty water-casks.

Every part of the suspected ground was run and sounded over in open daylight, through the different phases of the moon, at all times of tide, and under every variety of wind and weather. Great pains were taken to explore it during the spring tides, when it might be expected to be uncovered; and, in short, the utmost diligence was exerted to bring this examination to a successful termination. This search, however, like those which preceded it, has failed to produce the rock; and though it is not presumed to assert that it has no existence, yet it is hoped that a reference to the chart will justify the statement that it cannot occupy any of the situations there assigned to it.

During the month of June, many of the mast-head men and others were momentarily deceived by the blowing of whales, which at that time were numerous; and in August a small black object, a little above the surface of the sea, was productive of similar hope and disappointment. It was first seen from the *Leveret*, and on examination proved to be the trunk of a very large tree, with its roots projecting two or three feet out of the water. They were covered with weeds, barnacles, and other marine productions; and presenting a rounded top, abrupt on one side, and sloping on the other, corresponded very minutely with the description of the supposed rock given by Mr. Carrol.

That fish sometimes give rise to reports of this nature, and that even experienced persons in nautical affairs may be deceived by them, is very certain, as the following anecdote, on unquestionable authority, will show:—

A frigate was one day running into the Rio de la Plata, with her studding-sails set, when the look-out man at the mast-head reported breakers on the bow. The captain believing such a danger could not have escaped the notice of the Spaniards, and having also a tolerable chart of the river, suspected it must be some floating object, and ordered the ship to be steered directly for it. The officers were on the alert; glasses were frequently directed to the spot; and all concurred in representing it a rock a little above water. Anxious looks were directed to the captain, whom they now considered unnecessarily running into danger; but that officer kept carefully watching his approach, and as the studding-sail boom was just over it, the cetaceous monster (for such it was) hastily made off, and rising again to blow, finally disappeared. It was observed to have an excrescence on its back, covered with shell-fish. The sea broke gently on its weather side, and appeared becalmed to leeward; and so perfectly did it resemble a rock, that had the vessel passed at a distance without

disturbing it, there can be little doubt but it would now have had a place upon the list of vigias. In the fact here related will probably be found the history of many of those fearful marks which crowd our charts; and as the greater part of the officers of a frigate were deceived into the belief that what they saw was really a rock, is it unreasonable to suppose that similar deceptions may have given rise to some of the positions of the Aitkins' Rock? It is to be observed, in the case above mentioned, that there was only a little ripple about the body, but no breakers; and this circumstance had not escaped the intelligent eye of the commander.

The *vigia*, which is the subject of this paper, has been introduced to notice by enumerating the various authorities on which it rests; and those who feel interested in the inquiry cannot fail to have observed how much they are at variance with each other. The first one describes it four feet under water, without any mention of breakers, though it was blowing a gale of wind at the time. The second describes it as rugged, seven or eight feet high, and the length of the vessel's keel; and though an observation was obtained only four hours previously to falling in with it, the position assigned by this authority is twelve miles south, and one hundred and fifteen miles west, of any other on record. The third was unable to find it, though he passed within five fathoms, and hove to for the purpose; consequently there could have been no breakers on it. He further describes it as of a horse-shoe form. The fourth, who actually sounded *on*, and all round it, calls it a very elongated cone—the whole mass perfectly smooth, as far as could be seen under water. The fifth makes it ninety feet long, forty broad, and a little above water. The sixth two or three feet high, and thirty feet long; the north end smooth, and the south end like a fish's tail; and here again no mention is made of breakers, though it was blowing strong from the N.W. And, lastly, Mr. Anthony Carrol, who was personally communicated with on the subject, states it to be a small pointed black rock, according in every particular with the old tree which has been mentioned, and which was perfectly calculated to make such an impression if left unexamined, as was his case.

This brief recapitulation of the evidences for the Aitkins' Rock places their discrepancies in a striking point of view; and whether we regard the discordant appearances, or the variety of positions which have been assigned by them, it seems impossible they can refer to one and the same object. It may be added, that, from the experience we have had of the *swell* on the coast of Ireland, no rock could be so situated without producing very high breakers in bad weather, which would be visible at least two or three miles. The Frenchman's Rock lies off the north coast of Ireland, only three miles from the land, which affords it considerable protection

from the western swell :—moreover, it stands on a bank of soundings of great extent, and has eleven feet water over it at low water spring tides : yet this always breaks in bad weather.

It is possible that Aitkins' Rock may have been a volcanic production, which has since subsided, like the Sabrina island of the Azores ; but certainly no bank exists near any of the positions assigned to it, at the depth of one hundred and fifty to two hundred fathoms, except, indeed, those which place it on the bank which surrounds Ireland, where, according to Mr. Faulknor, it could not be, as he had no bottom with one hundred and fifty fathoms of line, at thirty fathoms distance from it.

In closing this paper it may be well to state, that although the subject of it has defied our zeal, and the primary object of our pursuit has not been attained, yet the employment of the vessels has been far from useless, since there has resulted from the inquiry a partial delineation of that great bank on which Ireland and the Hebrides are based. Its western limits have been determined between the 54th and 56th degrees of latitude, which comprehend the space by which our northern traders approach the Irish Channel, and the chain of soundings cannot fail to be highly serviceable to them in making a landfall.

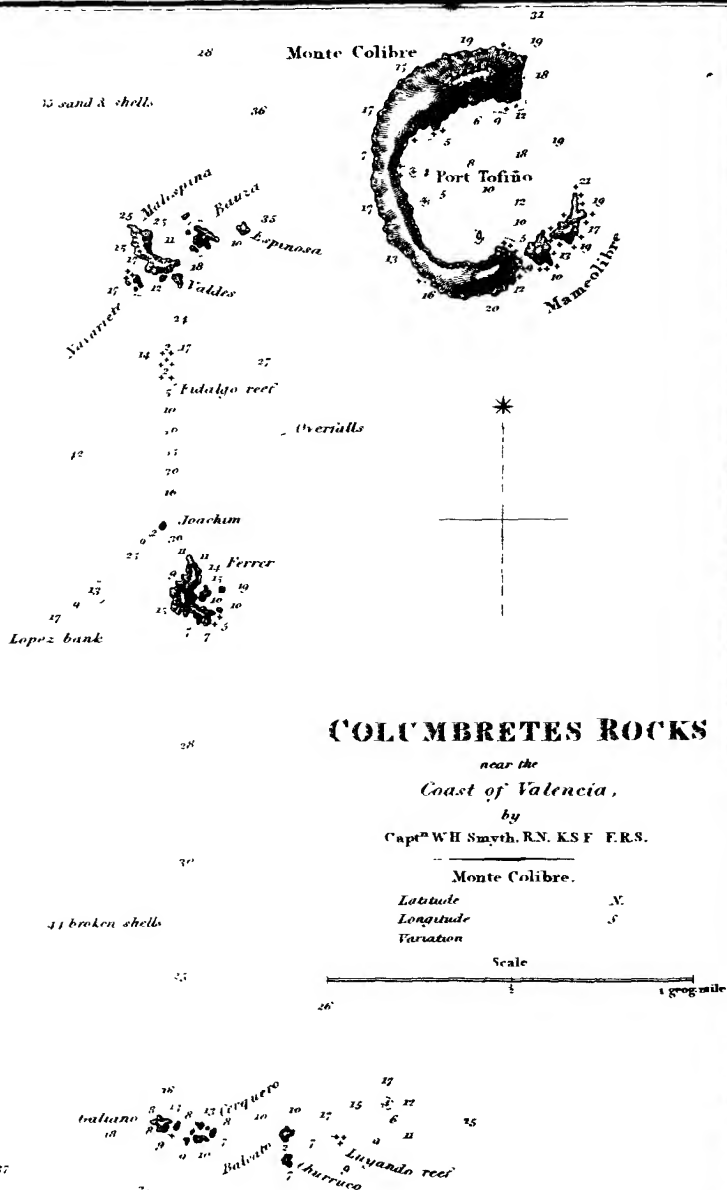
Our pilot, who had served nearly half a century in that capacity on the north of Ireland, assured us that there are soundings the whole way from Tory Island to Rockall. Our time and circumstances did not allow us to ascertain this ; and it is to be regretted that at a period when Great Britain has added so vastly to the stores of hydrographic knowledge, the banks which surround her own shores are many of them unknown both in quality and extent.

V.—*On the Columbretes, Volcanic Rocks near the coast of Valencia, in Spain.* By Captain Smyth, R.N., F.R.S. Read the 10th of January, 1831.

THE increased avidity with which the study of nature is now pursued, has undeniably been aided by the geographical inquiries of the last century ; and it is obvious that the same influence will still be strongly exerted in establishing a knowledge of the organic and inanimate relations of the globe. I therefore offer no excuse for drawing attention to the subject of the present communication.

Much discussion has been lately directed towards St. Paul's, Santorin, and other volcanic islands, which enclose circular bays, or gulfs, whence the theory of 'craters of elevation' has arisen ; and it may therefore be acceptable to learn that there is another, which, though almost in our neighbourhood, has not been suspected by geologists. About thirty-five miles to the eastward of





COLUMBRETES ROCKS

near the

Coast of Valencia,

by

Captⁿ W^m Smyth, R.N. K.S.F. F.R.S.

Monte Colibre.

Latitude N.
Longitude S.
Variation

Scale

1 geographic mile

Monte Colibre, S.W. 1 1/2 miles

J. & C. Walker Sculp.

Published in the Journal of the Royal Geographical Society by John Murray Albemarle St London, Sept^r 1832.

the limestone range which separates the alluvial plains of Valencia and Tortosa, and in a bearing with the northern capes of Majorca, is a group of rugged rocks, sometimes termed Monte Colibre—a name adopted by d'Anville, and also by the recondite editor of the 'Quarter Waggoner:' but they are more generally known amongst Mediterranean navigators as the Columbretes, though, as no plan has hitherto been published, geographers have had very indistinct notions of their extent and geognosy. Tosiño, the author of the best description we have of the Spanish coasts, remarks—'It is said that the small islands and rocks amount to fourteen;' from whence, as well as from the erroneous position he has assigned them, his stating the bay to be on the N.E. side, and his describing the smaller islets as lying S.S.E. of the large one, we may infer that he did not personally visit them. The industrious Coronelli, in his *Isolario*, dismisses them thus:—'Tra la Majorica, e le foci del fiume Ebro, si vede la *Mammeolibra*, si piccola, e povera, che non havendo cos' alcuna di considerabile, non merita altra descrittione.'

My attention was first attracted to these rocks from perceiving a xebec at anchor in the port, while we were passing them in chase of a stranger; and I then admired the picturesque forms of the broken masses, which presented the appearance of being the wrecks of a more considerable island. But on a second visit I was so struck with their peculiarities that I examined them with some interest; and although giving appellations on such a coast may seem intrusive, I was led to call the highest hill by the well known name of Monte Colibre, and also to denominate the several rocks after those Spanish officers to whom geography and science are deeply indebted, in order that future visitors may distinguish them in description.

The largest of the Columbretes, from its comparative magnitude, may merit the name of island. A reference to the plan will at once show how evidently it has resulted from igneous causes, and that its harbour is the mere mouth of an ancient crater, though now forming a tolerably secure anchorage for vessels, in westerly winds. Here privateers, and especially the corsairs of Barbary, have been known to lurk; and as the summit of the hill commands an extensive horizon, they have pounced upon their prey very unexpectedly. The port is somewhat more than a quarter of a mile across at the entrance; and as it forms a capacious basin, would hold several vessels, in case of need, in from five to twelve fathoms, on an indifferent bottom of mud, weed, and rocks. It is tolerably secure from all winds but those from N.E., E., and S.E.; though, in the latter case, craft might find shelter close to the Mammeolibre, the channel between which and the point is practicable for boats, having nowhere less than

three fathoms depth. I was told, by a fisherman of Valencia, that fresh water might be obtained in small quantities, but we found none. By observations taken on Monte Colibre, the latitude of the station was in $39^{\circ} 53' 58''$ N., the longitude $0^{\circ} 44' 27''$ E. of Greenwich, and the magnetic variation was $17^{\circ} 41'$ W., in 1823.

Monte Colibre, or the north hill, is of so rounded a form as to assume the *bell-shaped* disposition incident to its affinities; a declivity dips from thence towards the middle of the island, from which there is a gradual ascent to a hilly hummock on the south, giving the whole the appearance known to seamen as *saddled*. These hills are covered with an exuberance of dwarf olives, geraniums, prickly pears, myrtles, and brushwood; but every other part exhibits lavas, obsidian, and scoriæ, as obdurate as if the fires to which they owe their origin had been but lately extinguished. A few rabbits were seen, and the margin abounded with crabs and other shell-fish; but what excited the greatest surprise, and indeed is very remarkable, was, that the seamen were actually impeded in their progress with the instruments, by the number of snakes which infested the whole space. They were generally between two and three feet long, finely striated with dark zig-zag lines, on a bright yellow ground, blending whiter at the belly, and of great beauty.

At the south point of Port Tosiño are two high conical rocks of vitreous trachyte, which, to preserve Coronelli's term, I called Mammeolibre. They appear to have formed part of the continuation of the crater, from which the eastern portion has either been worn away by erosion, or has disappeared by subsidence; for there can be little doubt of its having been a complete cone when this spot was the theatre of burning eruptions. Indeed, the encroaching and destroying action of the sea is everywhere strongly attested by the figure of the shattered relics; and the overhanging precipices, with the shadows cast by a fervid sun over cavernous cliffs, enriched with the protruding faces, and surmounted by parallel strata of porphyritic conglomerate of various hues, heighten the effect of a scene which is splendid and characteristic, notwithstanding that the expanded horizon renders the foreground somewhat diminutive.

About a mile to the westward of Monte Colibre is a group of rugged rocks, of which Malaspina, the largest, is saddled in form, but of a bold and various surface; while the gentle inclination of its external flanks, as well as those of its neighbour Bauza, together with the scarped faces of their interior cliffs to the northward, gives them also the aspect of the rent cone of a former volcano,—perhaps a parasite of the larger one.

Bearing S. 16° W., and distant three nautical miles from the

station on Monte Colibre, is Galiano, a high perforated rock resembling a ship under full sail; and several rocks and reefs stretch more than half a mile to the eastward of it, against and over which the sea breaks very heavily in gales. Nearly in mid-distance between Galiano and Malaspina lies Ferrer, a remarkable quoin-shaped phonolitic rock, with smaller ones in its vicinity; so that the Columbretes are divided into four detached clusters, with deep water in the channels between them. The approach on all sides is extremely bold, and the soundings gradual, diminishing from fifty fathoms, over a bottom of brown sand and broken shells, at three or four miles off, to forty and twenty in the passages between the rocks, except where Fidalgo, Lopez, and Luyundo reefs are placed. Even between Ferrer and Joachim, there are no less than thirty fathoms of depth.

The whole of these volcanic fragments consist of similar materials; and amongst the specimens which I brought away are compact lavas, some of which are speckled with white calcined substances, while others contain black acicular crystals, and numerous small clusters of brilliant yellow ones; the former having probably lost their water of crystallization from intense heat, and the latter been formed by the condensation of vapours in the cavities of inflated lavas, on cooling. Intermixed with the scorix—which are highly tinged with iron, and so cellular as to resemble coarse pumice—are numerous masses of amorphous schorl; and both hyperstone and pearlstone occur.

The geological relations of these islets, however, are not the only interesting points relating to them: their ancient nomenclature requires also some elucidation. It is known that the Greek geographers applied the name of *Ophiusa* to an Iberian island, from its abounding with serpents, and that the Romans, for the same reason, called it *Colubraria*; but the identity of the place has rather been inferred than ascertained—custom having long conferred the name on Formentera; and, to countenance the application, we have been gravely told of the myriads of snakes which have caused it to remain uninhabited. But a visit to the spot proves the misnomer; for from its population (despite of Algerine ravages) and its culture, together with the numerous vestiges of matamore granaries, it is readily seen that the present appellation has been a consequence of the excellence of its corn harvests. Iviza, or Ibiza, the *Ebusus* of Strabo, and *Ebyssus* of Ptolemy, was undoubtedly called *Pityusa major*, and Formentera *Pityusa minor*,—names which they deserve still from their resinous pine-trees; and the peculiar boast of the natives is, that no venomous reptile can live in Formentera, whether from the presence of the *semper-virens*, one of the snake-roots of antiquity, or that their earth has the quality of destroying serpents, as Pliny records that of *Ebusus* to

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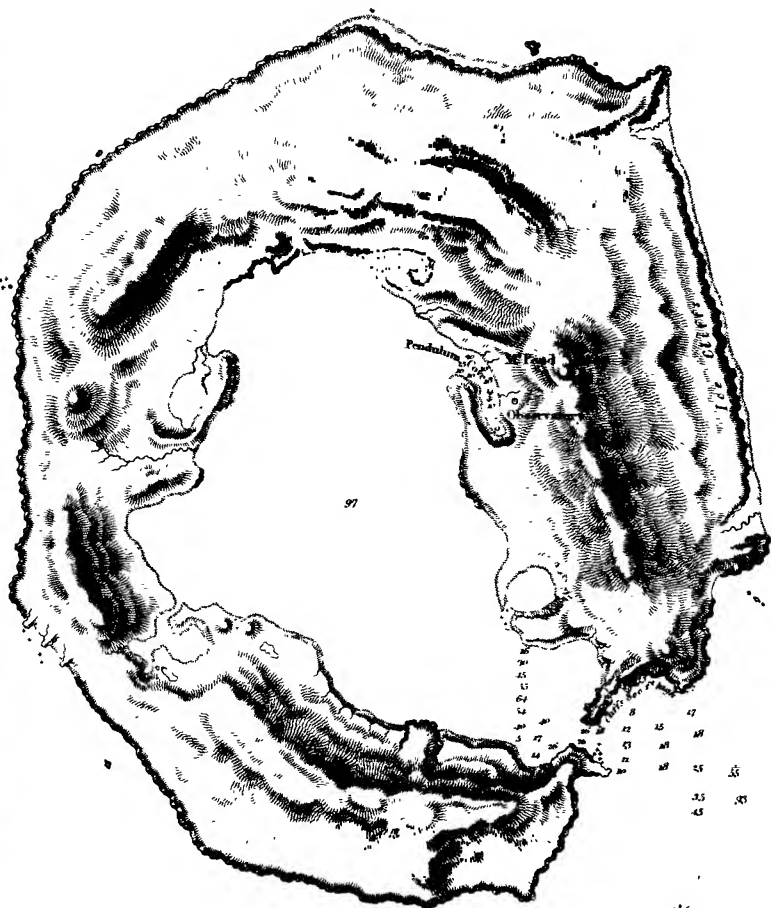
have done, I know not. Suffice it, that the fact wars against the French encyclopædists; and others, who have asserted this island to remain desert and uninhabited—‘à cause de la quantité extraordinaire de serpens qui s’y trouvent;’ and where, then, are we to look for the *Ophiusa* of the ancients, but in the Columbretes?

VI.—*Account of the Island of Deception, one of the New Shetland Isles.* Extracted from the private Journal of Lieutenant Kendal, R.N., embarked on board his Majesty’s sloop Chanticleer, Captain Forster, on a scientific voyage; and communicated by John Barrow, Esq., F.R.S. Read 24th January, 1831.

[THE New Shetland Isles are a cluster recently discovered, or, more correctly speaking, re-discovered, by Mr. Smith, a master in the Royal Navy. Dirck Gheritz, who commanded one of five ships which sailed from Rotterdam in 1598, to make a western passage to India, was separated from his companions off Cape Horn, and carried, by tempestuous weather, as far as latitude 64° S., where he discovered a high country, with mountains covered with snow, resembling the coast of Norway; and there can be no doubt that this was the group of islands in question. They seem to be a continuation of the Cordillera of the Andes, and Archipelago of Tierra del Fuego; being, for the most part, precisely of the same formation with the latter—their strata even inclining the same way. But the particular island here described is completely volcanic; and its circular crater bears a very striking resemblance to that of the Island of Amsterdam, or, as it is called by some, St. Paul, in the mid-ocean between the Cape of Good Hope and Australia.]

The shape of both, too, is so like that of the lagoons which are met with in nine-tenths of the numerous low coral islands that are scattered over the intra-tropical portions of the Pacific, as to give a colour to an opinion I was led to form many years ago, that these extraordinary fabrics, the creation of minute marine worms, are for the most part based on the edges of sub-marine volcanic craters, rising sufficiently near the surface to allow these creatures the requisite light and heat to carry on their wonderful operations, creating perpetually new islands. And this consideration may perhaps give additional interest to the paper immediately following that here subjoined; which, as minutely describing one of these coralline formations, is thus, in some degree, connected with the two preceding it.—JOHN BARROW.]

5th January, 1829.—The partial clearing of the fog brought to view the desolate lands of Shetland. The first that was descried was the mountainous island, the westernmost of the group, called, after its discoverer, Smith’s Island; and a more dreary aspect of rugged barrenness I never beheld. It rises abruptly from the water’s edge, and in the centre towers to the height of between



DECEPTION ISLAND

New South Shetland.

by Lieut E.N. Kendall.

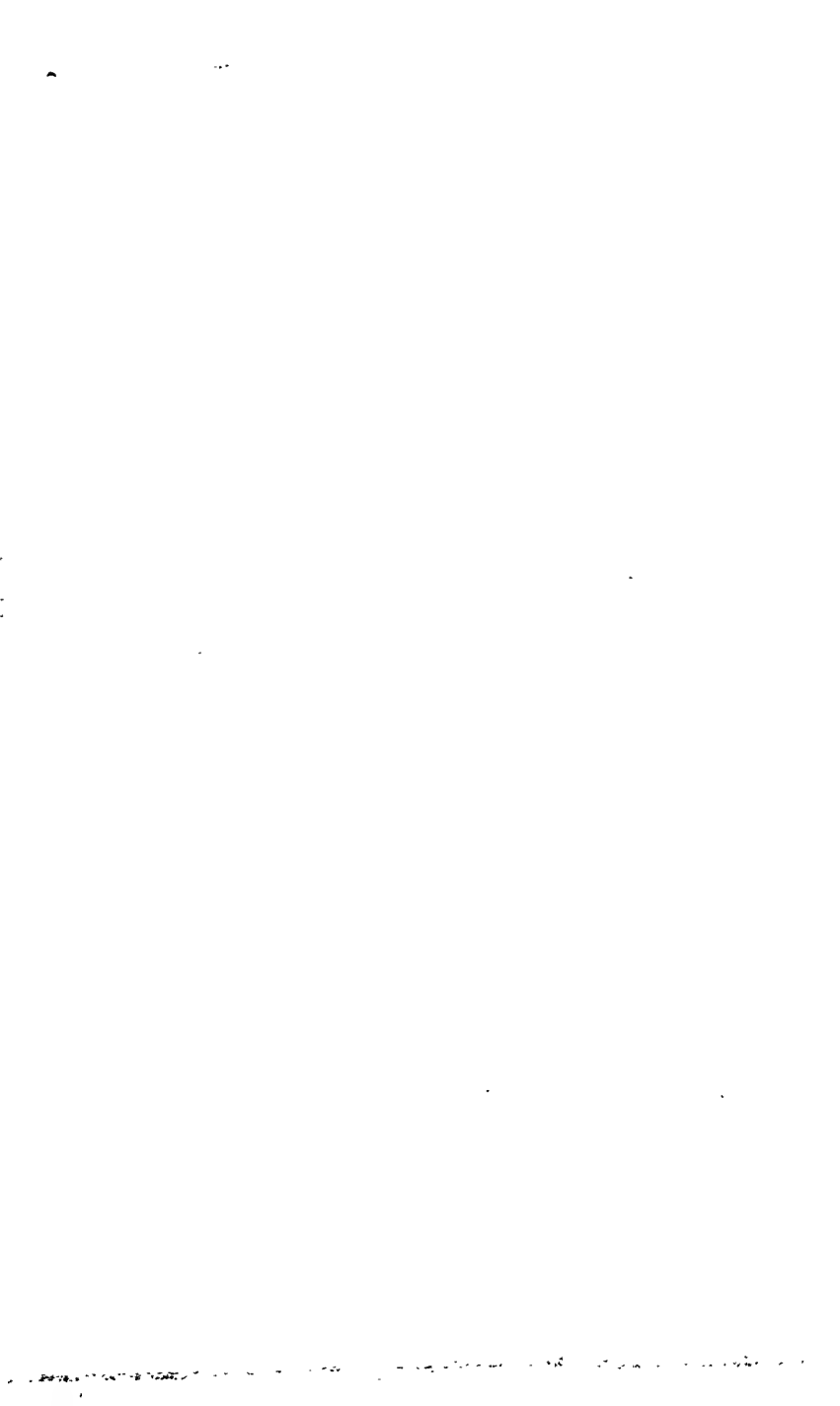
1829.

Observatory.

Latitude	67° 53' S.
Longitude	60° 26' W.
Time	21 0 E

Scale

0 1 2 3 Geogr. Miles



six and seven thousand feet, and might readily be mistaken for a mighty iceberg, but for a few patches where the sides—too perpendicular to retain the snow with which the island is elsewhere covered—allow the blackness of the rock to become more conspicuous, from the contrast with the dazzling whiteness of the surrounding scenery. Icebergs, in great numbers, were strewed in every direction around; no fewer than eighty-one were counted at one time. A heavy tide rip or race was running; and the height of the land—to which we had approached much more closely than we should otherwise have ventured, in consequence of the fog—becalmed the sails, which flapped uselessly against the masts, at the same time that the ship was driven to and fro at the mercy of the current.

We were released from this unpleasant dilemma by a strong gale that arose without any sort of warning; but as it was accompanied by a thick fog, the most unwearied vigilance and most active measures were necessary to avoid running foul of the numerous masses of ice by which we were conscious of being surrounded.

In the course of the following afternoon, a partial clearing of the fog showed us more land extending along the S.E. horizon. Like Smith's Island it was only distinguishable from the numerous icebergs by which it was surrounded, by the towering height of its mountains, and by the black fringe of rocks that skirted the water-line. On the next morning it was beautifully clear, and so much land was visible, that, in the absence of accurate hydrographical information, we were at a loss to decide on our situation, until the peaks of Smith's Island were recognized in the N.W. quarter at the distance of sixty-five miles. At this time the vessel was surrounded by vast multitudes of whales, penguins, and birds of the petrel tribe, who appeared, by their sportive gambols, fully aware of the propriety of making the best use of the few moments of fine weather allotted them by the niggard season of this desolate region.

This interval of fine weather admitted of the ship's place being determined; and in the afternoon, being abreast of a projecting headland, Captain Foster and myself left the ship with the view of effecting a landing, and taking possession of what we were aware was a new discovery.

On reaching the cape the surf was found so violent that we could only effect our purpose by entering one of the numerous inlets that presented themselves, and even then it was a task by no means easy,—the land being composed of a collection of needle-like pinnacles of sienite, covered with snow, and only accessible by watching an opportunity of jumping from the boat during the recession of a wave. A copper cylinder was deposited at the

landing-place, enclosing a paper with the usual information; and the requisite bearings having been obtained, we returned to the ship, whose course was then directed for Deception Island, which the accounts of the sealing vessels pointed out as affording the best harbour in South Shetland.

Possession Cape is situated in $63^{\circ} 46' S.$, and $61^{\circ} 45' W.$ We procured specimens of its rock, and a small quantity of red snow, similar to that which had been met with in the arctic regions.

The Island of Deception was seen on the next day,—its position being indicated by an insular peak near it, to which the sealers have applied the appropriate name of Sail Rock. The resemblance to a vessel was indeed so perfect that we found it difficult to divest ourselves of the sensation to which the presence of a consort naturally gives rise.

Deception Island presents a different appearance from the rest of the group. The warmth of the soil and the blackness of the cinders make it appear more like *terra firma* than the other islands, and its rocks are also more denuded of their snowy mantle.

On the S.E. side is an opening of about six hundred feet wide, which affords an entrance to a kind of lake or internal sea. This lake, whose diameter is about five miles, is very nearly circular; and as the diameter of the island itself is only eight miles, the land of course forms a kind of annulus around it.

The principal part of the island is composed of alternate layers of ashes and ice, as if the snow of each winter during a series of years, had been prevented from melting in the following summer by the ejection of cinders and ashes from some part where volcanic action is still in progress; and that such is the case appears probable from the fact of there being at least one hundred and fifty holes, from which steam was issuing with a loud hissing noise, and which were visible from the top of one of the hills immediately above the small cove where the Chanticleer was secured.

The depth of the lake was ninety-seven fathoms, with a bottom of cinders; and the beaches, which were composed of the same material, abounded with springs of hot water, which afforded the extraordinary spectacle of water, at the temperature of 140° , issuing from beneath the snow-clad surface of the soil, and running into the sea, which rarely exceeded the freezing point. Alum was procured from some of these springs, and the lee shore of the lake was strewn with immense quantities of pumice-stone. The hills, whose height was about one thousand eight hundred feet, were principally tufa, scoriæ, and a red brick-like substance; but in some places points of obsidian and hard compact lava were seen. The cliffs on the northern side of the entrance rise perpendicularly to the height of eight hundred feet, and appear to be of

older formation than the remainder of the island. From them a small rock juts out, and bears on its summit a most ridiculously striking likeness to a cock, which seemed, with outspread wings, to hail the arrival of another 'Chanticleer.'

The island is inhabited by penguins, from whose rookeries proceeded a most deafening din, saluting the ears of the passenger in the most discordant notes. Our principal amusement, during the intervals of relaxation from labour, was to watch their motions, for their attitudes were excessively ludicrous, and their curiosity unbounded; and though so constantly before us, we always enjoyed a hearty laugh on visiting the rookeries for the purpose of procuring some of them for food. They remained still until knocked down with a stick, but then 'did battle' most manfully with their beaks and flippers. I should suppose, that in the early part of December, two such vessels as the Chanticleer might have been easily loaded with their eggs; but at this time the young were nearly fledged, and the noise, dirt, and stench proceeding from their abodes were almost insupportable.

Besides the penguins, we found sea-leopards, Port Egmont hens, pintados, and various kinds of petrels, who bred in the rocks. There was nothing in the shape of vegetation except a small kind of lichen, whose efforts are almost ineffectual to maintain its existence amongst the scanty soil afforded by the penguins' dung.

Several sea-leopards were killed during our stay; but they differed from those described by Mr. Waddell, in having much shorter necks and hairy flippers. They have also a vein of most extraordinary dimensions in the stomach, which was supposed by our medical gentlemen to afford a receptacle for such a quantity of blood as would enable them to continue a very long time under water while in pursuit of their prey. We found fish in their stomachs, but all attempts with the seine were unsuccessful.

It was three days after our arrival before we could place the ship in safety, from the violence of the gales, and from the ground being entirely composed of cinders, in which the anchors had no hold. She was at length secured in a small cove, and we lost no time in erecting the observatories—well knowing that our operations were limited by the season.

It was, however, cheerless work. The fogs were so frequent that, for the first ten days, we saw neither sun nor star; and it was withal so raw and cold, that I do not recollect having suffered more at any time in the arctic regions, even at the lowest range of the thermometer. When to these discomforts is added, that the short allowance, to which we had been reduced, barely formed sufficient for a healthy man's breakfast, you may judge whether what we have accomplished has not been *à la force*. I assure you

we were perfectly ravenous, so much so, that on a moderate calculation, upwards of seven thousand penguins were eaten during our stay, which nothing but the most absolute necessity could have induced us to touch; and even portions of the sea-leopard, fried in their own blubber, were accounted palatable food. Notwithstanding this, we did our work; and, being allowed a boat and four men, I surveyed the island, sleeping at night on the cindery beach, with no other covering than a canvas tent.

During the survey, several timbers of a ship of large dimensions were seen on the N.E. side of the island, half buried in the sand, together with some casks and iron hoops; and on the edge of a small cove we also found various relics of former visitors—probably sealers, as there were buildings whose blackened surfaces exhibited the action of fire. Having observed a mound on the hill immediately above this cove, and thinking that something of interest might be deposited there, I opened it; and found a rude coffin, the rotten state of which bespoke its having been long consigned to the earth, but the body had undergone scarcely any decomposition. The legs were doubled up, and it was dressed in the jacket and cap of a sailor, but neither they nor the countenance were similar to those of an Englishman. The stones were replaced, and a post erected, with a notice, in hopes of protecting this humble monument from further intrusion.

On a point of the cove in which the ship was secured, we buried a register thermometer, so that any future visiter might become acquainted with the extreme ranges of temperature in this climate.

We took the hint of the freezing over of the cove, and effected our retreat with much difficulty and severe labour, from the fury of the gales, whose violent gusts had before blown down all our tents, and broken many of the instruments. We quitted it on the 8th of March, just two months from our arrival, amidst the acclamations of thousands of penguins, who croaked a most discordant chorus; and indeed it was a day of rejoicing to us also when the shores of Deception faded from our view.

VII.—*Account of the Cocos, or Keeling Islands.* Transmitted by Rear-Admiral Sir E. W. C. R. Owen, K.C.B., and communicated by John Barrow, Esq., F.R.S. Read 24th January, 1831.

THE Cocos or Keeling Isles extend from 12° to 12° 14' S. latitude, in 97° 4' E. longitude; and are now in the occupation of two English gentlemen, Alexander Hare, Esq., and Captain J. C. Ross, who have undertaken to cultivate and render them productive. So far as appears, they are entirely coralline in their

formation,—the sand and fragments dug out of the wells near the middle of the isles, being altogether of the same material, rounded by attrition in water, with that which at present constitutes the shores and beaches. The circular form of the group, as well as of the detached northernmost or Keeling Isle, may, however, countenance the idea of their being originally based on submarine volcanoes long extinguished, though no traces of the occurrence of earthquakes, or other natural convulsions, are now discernible.

Around the exterior of the isles the shore is heaped up by the surf from twelve to twenty-one feet above the level of the sea (high-water mark); and the interior is not in general elevated more than from three to six feet above that level.

The soil is mainly composed of fine calcareous sand; in some parts marly, in others consisting of rounded pieces of coral and shells, with a small mixture of vegetable earth. It is from one to two feet deep, and lies on a strong platform of aggregated coral and shells. Quantities of pumice-stone and lava are thrown on shore by the sea, which, by decomposition, gradually add some earthy matter.

The general produce of the isles is, first, the cocoa-nut palm-tree, which, when properly thinned out, may be expected to yield as abundantly as in any part of the world.

Second.—A tree producing hard wood of a dark colour, fit not only for fuel, but for timbers of small craft, and vessels up to three hundred tons.

Third.—A tree having a leaf resembling in size and form the leaf of the boxwood. The timber is hard and heavy, of a reddish colour, fit for small parts of machinery and boats' timbers. The bark, having an uncommonly large portion of tannin, may be useful for making leather, and preserving nets.

Fourth.—A large straight-growing tree, which furnishes poles and small spars for rafters. It is durable under cover, but subject to rapid decay when exposed to the weather.

Fifth.—Another large straight-growing tree, with leaves and fruit resembling the jack-in-the-box of the West Indies. The timber is, however, soft and of little value.

Sixth.—A tree frequently of large dimensions, the wood of which decays even faster than it dries. Its leaves may be used as greens: they are good food for hogs; and, with the trunks, supply a considerable quantity of vegetable matter to the soil.

Seventh.—The tree called warroo by the Javanese. It is planted by them in front of their houses for the sake of its shade and flowers. The timber is useful and durable; and, when of large growth, the bark affords a material for making twine or fishing lines.

Eighth.—The chinkauen, or dadap, a soft-wooded, green,

thorny-barked tree ; used in Sumatra for training the pepper vine upon.

Ninth.—A tree whose fruit, when cut, resembles plum-cake, and may be pickled. Its root, grated and infused into a lye of potass, yields a scarlet dye.

There are a few other scattered trees and shrubby plants, which furnish tolerable fire-wood, and grow near the shores.

Tenth.—Many species of creeping plants, one or two of which are highly antiscorbutic, and may be used as salading.

Eleventh.—Of grass there are about four species, all rough and bitterish, and not relished by animals.

It may be noticed that all these productions are transportable by the sea, in which their seeds and roots long retain their germinating power.

Two species of gannet, and the frigate bird, are particularly numerous about these islands, and many other oceanic birds visit them occasionally. A few cranes, bluish grey and white, sandpipers, and a species of sand-rail, are all the birds, not of the web-footed kinds, which are found here ; and land crabs, good for food, are plentiful.

Turtles are very numerous, and may be caught without difficulty, in all seasons.

Fish of many species, nearly all of good taste, exist in great abundance round the isles and throughout the bay. Ground sharks are not very numerous ; but a small species, having black tips to the tail and fins, is rather plentiful. No poisonous fish have yet been found.

No seals or other amphibious animals, except turtle, have been seen ; nor any reptiles or snakes.

Since the establishment of the settlement, the following plants and animals have been introduced, and are likely to succeed :— Fig tree, red mulberry, shaddock, custard apple, orange, lime, langsap, jamboo, alay, tamarind, pomegranate, papau or papaya, mongua, tanjung, chilies, aloes, hedge plants, Howwang shrubs, sundry plants from Mauritius, lemon grass, and five species of good grass for cattle ; the cotton-plant from Bourbon ; sugarcane, two species ; plantain and banana, seven species ; tobacco ; kladdy, an extremely farinaceous sort of large-sized pumpkin ; gourds, brinjals, water-melons, sundry other Indian vegetables, sweet and common potatoes. While the sun is in the northern hemisphere, flag-leaved leek, parsley, celery, cos-lettuce, endive, mustard, cress, turnips, radishes, and cabbages, thrive ; but they have not succeeded in obtaining seed from them. Maize, very productive, flourishes throughout the year, in which period four successive crops are obtained. Caffre corn, from the Cape of Good Hope, rises to nearly fifteen feet in height. Cattle, goats, hogs, poultry, ducks, geese, and turkeys, have also been imported.

The climate, though warm, is perfectly salubrious. The range of the thermometer, in the hottest season, is from 78° to 86° , and in the coldest, from 72° to 81° . The general winds are from south to east, subject to interruptions from the vicinity of the north-west monsoon, which lasts from January to March. No two seasons have been as yet alike, since the formation of the settlement, but until the present they have never had more than an occasional squall of a few hours continuance from the northward or westward.

The fresh water, obtained from wells dug on the isles, is good, wholesome, and abundant. The anchorage is safe—the narrow opening between the reefs of Horsburgh and Direction isles not affording ingress to any heavy sea, as was experienced during a late northerly gale. The channel leading into the inner anchorages has only three fathoms and three-quarters at low water, and is tortuous and narrow for nearly a mile. No vessel drawing more than twelve feet water may safely sail in; but ships requiring heaving down, &c., may be warped for that purpose into the basin inside of Direction island. There can be, however, no occasion for entering the port beyond the outer anchorage, except for safety in time of war. The intricacy of the entrance is then an advantage.

High water is at about half-past four o'clock in the anchorage, on full and change. When the sun is near the equator, the two tides are nearly equal, and rise from three and a half to four feet. When the sun is near the southern tropic, his zenith, or evening, tide rises to from five to five and a half feet, and the morning tide to one and a half and three feet. The contrary happens when he is near the northern solstice.

VIII.—*Notes respecting the Isthmus of Panamá.* Communicated by J. A. Lloyd, Esq. Extracts from them read 28th of February, and 14th of March, 1831.

[In November, 1827, Mr. Lloyd, who had served for some time previously on General Bolivar's personal staff, received from him a special commission to survey the Isthmus of Panamá, in order to ascertain the most eligible line of communication across it, whether by road or canal. And the result of his operations, in so far as they regarded the level of the respective seas, and the elevation of the intervening Isthmus, has been already published in the *Philosophical Transactions* for 1830, p. 59.—The following supplementary information seems, however, still interesting; and is extracted from Mr. Lloyd's entire notes communicated by him to the Royal Geographical Society, before his recent departure for the Mauritius.

His occupations while at home having put it out of his power to

revise his materials, it has been thought expedient to change their form from the first to the third person, the more distinctly to relieve him from the responsibility of their selection and arrangement. But where possible, his own words have been preserved.]

The Isthmus of Panamá, or Darien, may be considered as extending from the meridian of 77° to that of 81° west of Greenwich; with a breadth swelling out at the two extremities, and not less than thirty miles, even where narrowest, opposite the city of Panamá. Its whole extent is not, however, comprised within the Spanish American province; the Mandingo Indians to the N.E. maintaining a fierce and often turbulent independence to the present day.

I. PHYSICAL GEOGRAPHY.

The Cordillera, or great chain of mountains, which for the most part traverses the whole continent of America, is twice broken within the above limits.—

The northern Cordillera exhibits the first indication of depression in Nicaragua; but again rears itself, for a time, in the province of Veragua, and is there crowned with a very fine plain, called La Mesa (the table). In the eastern part of the province it breaks into detached mountains of considerable height, and of the most abrupt and rugged formation;—thence, proceeding still to the eastward, innumerable sugar-loaf mountains appear, not above three or four hundred feet high, with their bases surrounded by plains and savannahs;—and finally, about Chagres on the one side, and Chorrera on the other; these also disappear for a few miles, and the country becomes almost uninterruptedly low and flat. Presently, however, the sugar-loaf mountains again thicken, and becoming connected, form a small cordillera, running from about opposite Porto-Bello, to the Bay of Mandingo; where is the second break. The land then continues low through the province of Darien and Choco; and is most abundant in rivers, those on the north side tending to the Gulph of Uraba or Darien, and those on the south, to that of St. Miguel; beyond which point the cordillera again raises itself on an extended scale, and enters South America.

The general direction of the mountains in the vicinity of Panamá is north-east and south-west; elsewhere they vary, maintaining some relation to the line of coast, though not always parallel to it. Near Panamá, they do not exceed one thousand or eleven hundred feet in height; east of Porto-Bello they are greatly higher; and are generally covered with thick and almost impenetrable wood, growing on an extraordinary fruitful soil of great depth.

The prevailing rock is limestone, skirted on the north side with coral rock, on the south with indurated clay. The coral rock is

impregnated with a gelatinous matter, which gives it the property of adhering with great firmness to whatever, under water, it is placed against. It is close in its texture, and becomes very hard on long exposure to the air; but when first dug out is not more difficult to work than chalk. The indurated clay-stone, along the Panamá shore, is also an excellent building material; becoming, though soft at first, hard on exposure. For facility of working, it is generally obtained, where softest, below high-water mark.

Besides limestone, are found, in the interior, flint, chalcedony, jasper, iron-stone; and near Gatun, on the river Chagres, a very fine fire-stone, of great use in the construction of kilns, furnaces, &c. Clay and loam earth for bricks are also abundant, and sand to mix with lime in mortar.—‘In a word,’ says Mr. Lloyd, ‘perhaps no part of the world possesses a greater variety of building materials, nor more facility in procuring them, than does the Isthmus of Panamá.’ In the precious metals, however, the province is poor. In Panamá proper, only two mines are worked, Santa Rita and Pequeni, both for gold, but their produce is insignificant. They are in the mountains near Porto Bello. In Veragua, including Choco, a considerable quantity of gold is obtained by washing, and is reckoned very pure: copper and iron are abundant; and tin and mercury are said to have been found. But very little capital is embarked in the respective works; and the washings, in particular, are chiefly in the hands either of a few proprietors of slaves, who thus employ them, or of free Indians who select what they consider favourable situations, occupy them without paying any rent or acknowledgment, employ one portion of the year in collecting the alluvium from the bottom of the rivers and piling it up in heaps, a second in washing it, and the remainder in selling the produce, and wasting it in finery and excess. The total amount is thus comparatively small, and uncertain from year to year.

The vegetable productions of the Isthmus are most luxuriant; and in the vigour and varieties of its woods it challenges competition, in Mr. Lloyd’s opinion, with any other part of the world. The following is the list found among his notes, and he has also deposited with the Society a collection of specimens of the respective woods.

Amarillo.—A yellow wood; hard, tough, fine grained, and very durable; has no heart; is in great quantities, used for furniture, house-building, &c.,—*excellent*.

Amarillo de fruta.—Bearing a fruit; is yellowish white, with a long grain; tough and rather hard; is very common; grows to the size of not more than two feet diameter; the heart is of the same colour; is much used in house-building.

- Amarillo carbonero*.—A white-brown wood, with large heart, close-grained, and hard; it is very tough, and grows to the size of one foot or one foot six inches diameter; is used for houses and building; not very common.
- Amarillo colorado*.—
- Amarillo curabasuel*.—A green wood; hard and brittle; grows to a very large size, and is common; used for building, and making very large tables.
- Almasigo*.—White; something like white deal; soft, not tough; three feet diameter; very common. There is a resin comes from this tree when pierced, much used in the country for sores; has a very thick bark.
- Alcabou*.—Brownish, coarse, shiny grain; grows from six inches to two feet diameter, and common; has no heart; good for staves.
- Algarobo*.—One of the most excellent woods known; very hard and tough; reddish brown, with streaks; grows to a large size, and common; used for marine gun carriages, &c.; called, in Jamaica, *mogo*.
- Aguacate*.—Whitish; coarse-grained, hard, and tough; common; grows to the size of two feet.
- Ajisillo*.—
- Aromo*.—A soft, long-grained, shiny, whitish wood; very light and tough; grows to a good size, and common.
- Algodon*.—Cotton tree; white, spongy, light, close-grained, and brittle; very common.
- Balsa*.—Literally, 'raft;' light and very soft; the lightest of all woods—as light nearly as cork; used as rafts, and for polishing metals; grows to not more than one foot diameter.
- Cocobolo amarillo*.—Like rose-wood; very tough and hard; seldom grows to more than one foot diameter, but occasionally larger; has a fragrant smell, with dark-brown streaks, I think something like zebra-wood; is very common in the high dry lands.
- Cocobolo prieto*.—A very tough, hard wood, of a beautiful figured grain (I think like rose-wood); grows to the size of about three feet diameter, but generally smaller; is very plentiful; has a very fragrant smell when green; used more for carpentry than cabinet work.
- Cacique*, or king of woods.—One of the finest and most durable woods of South America; whitish yellow; hard, tough, and long-grained; grows to a large size, is common, and much used for building in the ground or water.
- Conejo*.—Hard, fine-grained, same as box-wood; grows to a small size, and is scarce.
- Conejo colorado*.—Yellowish; very close, fine grain, like holly, but harder; grows to a good size.
- Cedro cerollo*.—A class nearly the same as cedro real.
- Cedro espinoso*, or prickly cedar.—Grows to an immense size, but not

quite so much prized by the natives as *cedro real*; has a long spotted grain; is softish, brittle, and covered with prickles on the outside.

Cedro papallo.—One of the many species of cedar.

Cedro real amargo.—The finest cedar of the country; of a strong fragrant smell, and long grain; used for many purposes in carpentry, and boat and canoe building; grows to five or six feet diameter, and is very common.

Caoba.—Bastard mahogany; not very common in the vicinity of Panamá, but brought, in immense quantities, in canoes, from the coast, where it is very abundant, and grows to an immense size.

Corotu.—Like elm; grows to a large size; used for canoes.

Corotu prieto.—Soft and porous, like walnut; long-grained; grows to an enormous size; is generally used next in preference to cedar for the largest bongs and canoes, and is very abundant in all parts.

Caraño.—Close-grained, like holly; light brownish yellow; tough; grows to a small size, and is common; is most excellent for scales.

Carati.—Hard, close grain; brownish, tough, heavy; grows to the size of one foot six inches diameter, and is very common.

Calmitillo.—Like birch; grows to about one foot six inches diameter, and is very common.

Ciruela.—Very white, long grain, soft, spongy, not tough, small size, and scarce; the bark used medicinally as an astringent.

Ciromo.—

Ciquarri.—A fine wood; hardish and tough; something like bastard mahogany, but a more shiny grain.

Espino di mata.—Like birch; dirty, white, long-grained, soft, not tough; grows to a small size, and is scarce.

Espino colorado.—Like walnut-tree; a dark wood, nearly the colour of cedar, but much harder, and a close grain; grows to about three feet diameter; beautiful wood for boat-building.

Espabé mulato.—A softish, long-grained, close, tough, very knotty and refractory wood, but very lasting; grows to an immense size, and used universally for flooring and wainscoting; is very common.

Espabé prieto.—One of the common woods of the country; I think something like elm; grows to the size of five feet diameter, and is used in every branch of house-building; it has rather a rough grain to work.

Frijollillo.—Soft grain.

Faustin.—Like birch.

Guallacan.—*Lignum vitæ*; very common, close-grained, hard, heavy, and tough; works exceedingly well when rather green; grows to the size of from four to five feet diameter, and is much used for gun-carriages, wheels, &c.

Guachapali.—Soft, open grain, like walnut; brownish, tough, and

rather heavy; grows to four or five feet diameter; is much used for canoes and house-building.

Guayavito aseyjan.—White; a beautiful close grain; hard, tough, and heavy; grows to a small size, and is a common wood.

Guava machete.—Like birch; so called from bearing a fruit like, in shape, to a bill-hook, or machette; brownish white, long coarse grain, and middling tough; grows to but a small size, and is not common.

Guavano.—

Gallito.—Soft, long, open grain: whitish yellow, light and porous; grows to the size of one foot six inches diameter, and is common.

Guallavo ormigero.—So called because much infested by ants; it is of a whitish yellow colour, soft, rather tough, of a long open grain, and lightish; grows to about two feet diameter, and is common.

Guanavano.—A whitish yellow, light wood; is not very tough; grows generally in swampy grounds, to the size of two feet diameter, and is scarce.

Guavito.—A very white, soft wood, of an extremely bitter taste, and used as a medicine against the bite of serpents; grows to the size of from four to six inches diameter; is common, but has no other use than as a medicine.

Gorgojo blanco.—A very white, long-grained, soft wood, but close; grows to the size of from one to two feet diameter; rather brittle, but plentiful.

Guarumo.—

Guava peludo.—Fruit-tree, covered with hair-like substance; yellowish white, long-grained, tough, and soft; grows to two feet diameter, and is common.

Huesito, or little bone. —Hard, close grain, like bone; is much used for any small articles of ornamental cabinet-work, and handles to tools; grows but to a small size, and is not common.

Jagua colorada.—Soft, close-grained, but tough; grows to about one foot six inches diameter; is a dye-wood, and much used by the Indians to carve into spoons, or small articles of ornament.

Jagua.—Whitish brown; long, open grain; soft, but tough; grows to three feet diameter, and is common.

Jobo de lagarto.—A hard, close grain, like beech; the bark like the skin of an alligator; whitish, long-grained, and close; soft; grows to a large size, and is common.

Joboliso.—Close-grained, spongy, flesh-white, soft, brittle, and light; grows to a small size, and is common.

Igeron.—Like ash; one of the most plentiful woods in the country, along the banks of rivers; a soft, whitish wood.

Juasimo.—Hard-grained.

Juasimo prieto.—Yellowish white, or brown; soft, brittle, coarse-grained, and spongy; grows only to a small size, and is common.

Limon.—A fine-grained, shiny, whitish wood; hard and tough, some-

- thing like ash ; bears the lime, or small lemon of the country ; it is a native of dry ground, and grows to but a small size.
- Laurel*.—A coarse, brownish white wood ; tough, long-grained, and soft ; has a small heart ; grows to about two feet diameter, and is used for building common houses.
- Laureño*.—Soft ; a dirty white colour ; coarse-grained, brittle, and light ; is common, and grows to a small size.
- Moro*—(Fustic) ; yellow, with a long fine grain ; hard and tough ; grows to the size of three feet six inches diameter ; a fine dye ; very common in the woods on the banks of the river Chagres ; has a peculiar smell.
- Mamaisillo*.—A close grain ; grows from six inches to one foot diameter ; the grain something like birch, but very tough, and yellowish, reddish, and red-brown ; is much used for rafters, and is common.
- Mangle*. (Mangrove ?)—Close grain, like birch ; reddish-brown, and very hard ; is much used as timber for vessels ; is very common throughout the low and swampy lands near the coast.
- Madroño a la sano*.—Like lime-tree ; yellowish white ; of a beautiful close grain ; hard, tough, and heavy ; grows to one foot four inches diameter ; is common, and used for uprights in house-building.
- Madroño fino*.—Like box ; an excellent wood for turning ; grows to the size of one foot six inches diameter, and is common.
- Membrillo*.—White, hard, tough, close-grained, and lightish ; grows to a small size, and common.
- Muta palo*.—So called from its killing any other tree that it grows near ; a long, close, soft, shiny grain ; white, tough, and very common ; grows to a large size.
- Mamey*.—Like cherry-tree ; a fruit-tree of the country ; a hard, close grain ; grows to about two feet diameter, and is tough ; not very common.
- Malageto*.—Like ash.
- Maria*.—Grows exceedingly straight, and useful for masts and yards ; white ; long, close grain ; soft and light ; grows to one foot six inches diameter.
- Majaguillo*.—
- Majagua*.—
- Nispero*.—Hard, close grain ; yellowish white, tough, and light ; grows to about two feet diameter ; is common, and used for house-building.
- Naranjito*.—Like beech ; a very tough, close-grained wood, of a lightish brown ; only grows to a small size.
- Naranja del monte*.—Like box : a very fine, yellowish, close-grained wood ; very tough, and rather hard ; grows to the size of from six inches to one foot diameter ; is particularly used for planes, tools, and axe-handles, but is not very plentiful.
- Niema de huevo*.—A very tough, yellow wood, with a long, coarse grain ; grows to about a foot or fourteen inches diameter ;

there is a considerable quantity of this wood, but no particular use is made of it.

Negrite.—Whitish, soft, and brittle; long, spotted grain; grows to the size of about one foot six inches diameter, and is common.

Olivro.—Whitish, hard, tough, close grain, and heavy; grows to three feet diameter, and is common; the same as bird-lime tree.

Paiquillo.—White, close-grained, hard, not tough, and heavy; grows to a small size, and is scarce.

Pilon.—A reddish brown, close-grained, hard wood; very tough and smooth; grows to two feet diameter, and is common.

Pironel.—Soft.

Pali monton.—A whitish, close-grained, hardish wood; rather tough; grows from six inches to one foot diameter, and rather scarce; is generally used in house-building.

Palo blanco.—A white, shiny, long-grained wood; light and soft, with a very small pith; grows to one foot diameter; is common.

Quajado.—Hard, close, very tough, and untractable grain; a most excellent wood; grows to the size of two feet diameter; indestructible; common, and much used in house-building.

Quira.—A tough wood; very hard, close-grained, and heavy; of different colours—from light brown to very dark; has an agreeable odour when newly cut; grows to the size of three feet six inches diameter, (but generally from one foot to two feet six inches,) and very high; it is plentiful, and much used in house-building.

Roble.—Whitish grey, and long-grained, like deal: grows to a large size, and very common; used much in house-building, but particularly by the Indians for paddles for their canoes.

Sigua amarillo.—A yellowish wood; softish, fine-grained, brittle, and light; grows to the size of one foot, or one foot six inches diameter; is very straight, and not scarce.

Sota cavallo.—Hard, close grain; a whitish, stringy wood; excellent for hoops; long-grained, and tough; grows to a small size, but common.

Sereso.—Like beech.

Siti.—A hard, close, long-grained, dirty, brownish white wood; tough, and grows to a large size.

Sapo.—A whitish, soft wood, little prized.

Sangrillo.—White, long grain, and soft; common, and grows from four inches to one foot diameter.

Totumo.—The calabash tree; a common wood; grows to the size of one foot diameter, or more.

Torète.—Yellowish white, soft, tough, long grain, and light; grows to about one foot two inches diameter, and is common.

Vela.—Has a fruit of a long, white, candle-like pod; the wood is hardish, with a white, tough, and fine long grain; close and heavy; grows only to a small size, and is common.

Ubero de montaña.—Whitish, hardish, tough, and a fine, spotted, long grain; grows to a small size, and scarce.

Yalla armadillo.—A beautiful close-grained wood, almost like box, of a lightish brown colour; grows only to a small size—at most one foot diameter.

The fruits and esculent vegetables found in the Isthmus are those of other similar intra-tropical situations. The grains cultivated are rice and Indian-corn. The sugar-cane is grown, but not extensively. Coffee and cocoa are cultivated as required for domestic consumption. The caoutchouc tree,* milk-tree (*Palo di Vacco*), and vanilla plant, are all abundant in the woods. The charcoal made from many of the trees is considered excellent for smelting; and as such is exported to Peru, and in much request there. Some of them yield very rich and brilliant dyes, used by the Indians, but not yet known, as Mr. Lloyd believes, in commerce. The barks of others are medicinal, or abound in tannin. Ink is made both from gall-nuts and a bush called alsifax, resembling the caper. Many valuable resins are extracted from different trees; particularly one, distilled from the bark of a tree called the *palo santo*, or holy tree, which is highly fragrant, and is both used as a remedy for disorders, and burnt as incense. The *styrax officinalis* of Linnæus is very abundant, the gum extracted from it selling for two dollars a pound.

The wild animals of the woods are tigers, or rather tiger-cats, being seldom larger than small Newfoundland dogs; lions, at least so called; bears; racoons; sajinos, a species of wild boar, found in droves; wild hogs in herds; conejos, something like our rabbits, but larger; deer in abundance on the borders of the woods; hosts of monkeys of many species; with wild turkeys, both black and coloured; birds resembling our hen pheasants; pigeons, ducks, &c., all excellent eating. The most dangerous animals in the list are the wild hogs, which, when together in a drove, will, if fired on, readily attack one or two men. The tiger does not attack men, but freely preys on small cattle.

The isthmus has been famed for snakes and poisonous reptiles; yet Mr. Lloyd did not meet above one or two during his whole stay, and does not describe them. The country-people will seldom move after nightfall for fear of them, and always carry about their persons a 'contra,' or remedy, or what they generally consider still more efficacious, a 'charm,' against their bite. This charm is an alligator's tooth stuffed with herbs compounded and muttered over by some old woman. It is worn round the neck. The 'contra' is said to be very efficacious, being a bitter root called guavito, scraped down, and part of the powder taken inwardly, and part applied to the bite.

* With the gum flowing from this, and while it is yet liquid, the inhabitants manufacture a sort of water-proof cloth, on the same principle as in this country; but which, thus prepared, is more uniform, and never cracks.

A great pest in the country are what are called ganapatas, or ticks, which, in half an hour's walk in summer, will completely cover the person, and are taken from their hold with some trouble. A smaller, but even more insidious enemy, is the peoito (*pulga*) de la Savaña, or Savannah flea, not larger than a grain of sand, of a deep vermilion colour, and very numerous. They attack the softer parts of the flesh, and occasion a very painful itching. Common fleas, niguas or chijos, and mosquitos, are in the usual abundance. Fire-flies are common and very brilliant; with other insects, of which many, Mr. Lloyd believes, have not yet found a place in our entomological catalogues.

Of the domestic animals, and those chiefly used for food, some notice will be taken in another place.

The seasons are two—summer, or dry; and winter, or rainy. The first commences about the end of December, and lasts till April; the latter continues from April to December. The quantity of rain which thus falls in the year is prodigious; but its amount varies in different places. The clouds hang chiefly over the wooded heights; and at Porto-Bello, in particular, which is closely hemmed round by them, the rain descends in torrents, frequently accompanied by storms of thunder and lightning, of the most terrific description. Where the ground, to any extent, is level, however, and has been cleared of its wood, a great difference is perceptible; and at Panamá the following alternations may be observed. In April the weather becomes cloudy about noon; but after drizzling for half an hour, clears up. In May, from nine to eleven, it is dull, with slight rain; the afternoons being still fine. In June there is rain every morning and evening; but the mid-days are fair. As the season advances, the rain gradually increases; and is incessant throughout July, August, September, and October. In November the nights are always wet and cloudy; but through the day the sky begins to break. December brings a further improvement. And in January, February, and March, a shower of rain is as uncommon as a gleam of sunshine at the other season of the year.

One very remarkable phenomenon occurs throughout the whole isthmus. On the 20th of June the rain ceases for five or six days; the sun shines out during the whole day with the utmost splendour; nor is any instance known of irregularity in the recurrence of this break in the ordinary course of the season. It is accordingly reckoned on with great confidence by the inhabitants, kept as a period of social enjoyment, and called *El veranito* (or little summer) *di San Juan*, either from the feast of St. John, which is nearly coincident in time, or, as others say, from the village of San Juan on the Chagres, and about twenty-three miles from Panamá, where the phenomena is peculiarly observable.

The temperature and salubrity of the climate also vary in different places. Porto-Bello is one of the hottest and most unhealthy places in the world. At Panamá, on the contrary, the thermometer in the rainy season does not rise higher at night than 82° ; in the day than 87° : the winds are variable and cool; and though the rain is incessant, there is thus no stagnation in the atmosphere, nor consequent epidemic sickness. In summer the temperature rises to 90° , and even 93° , and in the day the reflection of the sun, from the smooth surface of the Pacific, with the heat of the winds, which blow steadily from the south-east over a track of dry savannahs, makes it very sultry; but the land-winds at night are cool, coming chiefly from the adjoining mountains: and the climate may be called generally healthy, though a considerable mortality sometimes occurs. This, however, Mr. Lloyd thinks, may almost always be traced to excessive indulgence, especially in the use of raw fruits and vegetables, and occasionally also to the quality of the animal food, which, at particular seasons, is, he thinks, injuriously affected by the excessive richness of the pastures. The family of the British consul resided four years in Panamá without an hour's sickness; and Mr. Lloyd and his companion were seventeen months in the country, during the whole time exposed to the utmost rigour both of sun and rain, yet with entire impunity.

II. TOPOGRAPHICAL DETAILS.

Rivers.—There is hardly a mile of land in this whole province which is not in the rainy season intersected by some little river or *quebrada*, which carries off the superfluous water, and is occasionally difficult to pass. But in the summer most of these dry up; and only the following rivers are considered by Mr. Lloyd worthy of particular notice. On the north side, and falling into the Atlantic, the Chagres, Pequeni, Trinidad, and Gatun, which all join, and form one before reaching the sea; and on the south or Pacific side, the Rio Grande, the Caymito or Chorrera, the Pacora, Indio, and Ballana or Chepo.

The Chagres takes its rise a considerable distance east of Porto-Bello, among the high mountains which approach the Bay of Mandingo; and after traversing a great tract of country, when nearly opposite Porto-Bello receives the Pequeni, which comes from the south-east, and is as large and broad as itself. The two thus form a very noble river, too rapid, however, to be easily navigable; and accordingly, though canoes ascend both branches in the dry season, even above the common point of junction, the passage is considered dangerous from the number of falls or rapids, in some of which the stream runs with extraordinary velocity. In proportionate distances, as it approaches Cruces, its

rate abates. At that town, which is twenty-three miles direct from the sea, forty-four as the river winds, it seldom exceeds three to three and a half miles per hour, even in the rainy season. At Peña-Blanca it runs two miles; at Gatun scarcely one; and at Brusa the current is in summer imperceptible.

‘ Few rivers of its size present more beautiful scenery on its banks than does the Chagres above Cruces. For miles together, it is bounded by enormous, abrupt masses of limestone, of the most curious and fantastic forms; in other parts, savannahs extend to the very edge of the river, covered with a particularly fine grass called grammalotti; and the noble bongo tree is seen, studding the banks, something in the shape of a well-trimmed yew-tree, but growing to a much larger size. In most places the river is shaded from the sun’s rays by a large tree called jigeron, which extends its branches across the river, its leaves being eagerly sought by the fish. The water generally runs over a bed of various descriptions of pebbles; and is in summer most brilliantly clear. In many places, near its source, it is much wider than at its mouth, occasionally breaking into distinct channels, and forming small islands; but in the rainy season these are all connected, and constitute one broad stream, with strong sets and eddies, caused by the abrupt turns, which render its navigation peculiarly perilous. Many years ago, from repeated and long-continued rains, the river rose until it arrived at the foundation of the church at Cruces, situate on a small rise, about forty or fifty feet above the present level; the greater part of the town was submerged, and no intercourse could take place among the inhabitants for some weeks, unless by canoes. But towards its mouth, as far up as the river Trinidad, it has never been known to rise more than six or eight feet, and this height the banks easily confine.’

The river Trinidad enters the Chagres about twenty-four miles from its mouth; and is also a large river. It rises very near the south coast, not far from the town of Chorrera, which, as will afterwards be seen, gives its name to a considerable river on its other side, flowing into the Pacific. Canoes of various descriptions navigate the Trinidad as far as a large town called Capua, which lies south-west of Chorrera, and bring down produce to Chagres. As high as Mr. Lloyd went up, which was not, however, to this point, the breadth was about two hundred feet, the depth from twenty-eight to twenty feet, the reaches (*calles*) long and straight, without falls or any other impediment to easy navigation.

The Gatun is also of considerable consequence, though neither deep nor wide. It rises in the mountains east of Porto Bello, and crossing both the roads leading from that city to Panamá, joins the Chagres in front of the town of Gatun, about eight

miles from the sea. Its depth does not exceed from seven to ten feet, even at the mouth, shallowing down to four and even to one, a few miles up; and its navigation was further impeded, when Mr. Lloyd visited it, by a number of trees, which, having been undermined by its waters in the previous rainy season, had fallen across and still encumbered it. Its importance to the inland communication, however, consists in this—that canoes bound to Porto Bello from Chagres, and which, in stormy weather, when the coast is dangerous, would be altogether windbound, are enabled to ascend it as far as a village called Aqua Sucia, whence their cargoes are conveyed to and from Porto Bello on men's shoulders. Besides which, several quebradas enter it to right and to left along its course; and all contribute somewhat to facilitate access to the adjoining country. Some considerable lakes also exist in this direction, with which several of them communicate.

With the united assistance of all these rivers, the navigation of the Chagres, below the junction of the Trinidad, is easy, and even superior to many much larger streams. The depth below Gatun varies from twenty-six to thirty feet; above, it is twenty-four, and nowhere falls below twenty-two, unless on some few spots, where only sixteen are found, which, however, have deep water close to them. This depth, too, is not in a channel, but the whole breadth of the river, which is from two hundred to three hundred and eighty feet wide. The banks are precipitous, of trap and porphyritic formation, wooded to the very edges, and almost everywhere admit of vessels being brought close to them, and the current, as already noticed, is here very moderate.

The Rio Grande rises to the north-west of Panamá, near a mountain called Pedro Miguel: and after receiving several streams, becomes navigable for very large canoes two leagues above its mouth, which is about two miles from Panamá; and here a bar runs across it, on which, at low water, there is not more than two feet water. The tide rises, however, so high in the Bay of Panamá, (about 18 feet in spring tides,) that vessels easily enter the river, and within the bar have good anchorage. Much interest was at one time taken in this river from the near approach, in some places, of its course to that of the Obispo, which falls into the Chagres a little below Cruces; and from the idea consequently entertained, that a water communication across the isthmus might be obtained by cutting a canal between the two. The shallowness, however, of the Chagres thus high up, the short and broken course of the Obispo, and the much greater facilities offered elsewhere, for establishing a communication by rail-road, appear to Mr. Lloyd to be, for the present at least, insurmountable objections to this plan. Were a great traffic already esta-

bled across the isthmus, it might become valuable in competition with other routes.

The Caymito, or Chorrera, empties itself into the Pacific about ten miles west of Panamá, and is formed by the junction of numerous petty streams, which take their rise in different parts of the western cordillera. It is very deep towards its mouth; and the branch called Rio Martin Sanchez continues navigable for large canoes, quite up to the town of Chorrera, which thus gives one name to the whole river: the other is derived from the prodigious number of alligators, sword-fish, &c., which infest it. The tide runs very strong in and out of this river, not being impeded by a bar at its mouth; and the anchorage for shipping is thus bad and exposed.

The Pacora and Indio unite before reaching the Pacific, near the island of Chepillo, about eighteen miles east of Panamá; and form a broad, rapid, and winding stream for several leagues above their mouth. To seaward they are protected by innumerable sand banks, between which at low water only very narrow passages appear, prodigiously infested with sharks and alligators; but at high water the navigation is good even for large ships some way up the river; and is open for canoes up the Pacora, as far as the town of the same name, and up the Indio for an equally considerable distance. On the banks of the latter an English gentleman, resident in Panamá, has erected a saw-mill capable of sawing from fifteen to twenty thousand boards annually. An inexhaustible supply of the finest timber is in its immediate vicinity; and the fertility of the soil, where cleared, is such, that a small portion, with the labour of two men only, affords an ample supply of every article of subsistence for the whole establishment. Several roads lead to it from the neighbouring villages; and one has been formed from a place on the united stream called Sambaja, where the largest class of vessels remain. The boards are rafted down the river, and have a ready sale, not only in Panamá, but also in Guayaquil and Peru, in the latter of which there is a scarcity of wood. On the banks, at the mouth, a wild animal is found, called *macho*, or *vacca del monte*, and sometimes also *dunta*, nearly of the size and appearance of a jackass; which, when shot, is considered a great dainty. All the land between this river and Panamá is low and dry.

The Ballano or Chepo is of great extent, and under the name of Canada, rises in the province of Darien, near the source of another river called Chucunaque, which falls into the Pacific in the Gulph of San-Miguel. The Ballano receives several considerable streams during its course, which is nearly west, and in some degree parallel to the coast, for many miles; until it sud-

denly turns to the southward, and enters the Pacific a few miles east of the Pacora. It is navigable as far as this turn; and on its banks a little higher up is situate the town of Chepo, which is of some consequence, as being the assigned place of communication with the Mandingo Indians. Farther on is a fort called Fuerte Terrable, built to prevent their incursions; and the line of the river generally is considered the boundary. An extreme, but not active, animosity is still maintained on both sides.

Communication across the Isthmus.—This is at present maintained chiefly by two lines of roads; one from Panamá to Porto-Bello, the other equally from Panamá, by way of Cruces or Gorgona, down the Chagres, to the sea-port of the same name at its mouth. There are some others in use for conveying cattle and other farm-produce to and from other points, but they are little known; and under the Spaniards their improvement and multiplication were much discouraged. Mr. Lloyd, however, strongly recommends a new line to be now formed, differing from them all, beginning on the Atlantic at a fine bay called Limon, or Navy Bay, about five leagues east of Chagres; thence to that river, some miles above its mouth, where its course approaches this bay, by a canal; thence up the river to a favourable situation on the south bank of the Trinidad, where its shores are excellently suited for being converted into wharfs and landing-places, both for goods and cattle; and thence, finally, to Panamá or Chorrera by a railroad—the latter being the shorter distance, but the former the preferable route, both as conducting to a better sea-port, and as terminating in Panamá, the capital of the department, and where its trade is already chiefly centered. And his reasons for this innovation will be readily gathered from the following abstract of the topographical notices bearing on this point, into which he enters in his notes at great length.

The harbour of Porto-Bello is most excellent: but such is its dreadful insalubrity, that at no period of its history did merchants venture to reside in it, except for a few weeks in the best season, in which was held its great and well-known fair. No class of inhabitants can long exist in it: even negroes do not generally support a prolonged residence; and it was firmly believed for a considerable time that it was especially fatal to women in childbirth. Animals of other countries are said also to feel the effects of the climate, and do not produce; and Mr. Lloyd states it as at least certain that domestic fowls brought from Carthagená and Panamá shortly cease to lay eggs, become emaciated, and their flesh soon gets little better than carrion. Pigs and mules seem to be the only exception, thriving here as in other parts of the West Indies; and toads are most disgustingly numerous. Such a port as this, however, is entirely unsuited to be the centre of a great

trade; and, accordingly, the intercourse between the two seas is already chiefly removed to Chagres. But the harbour to seaward is not there equal to what might be expected from the river which it receives and discharges. A ledge of rock runs across its mouth, with not more than fifteen feet water in the deepest places, and in many rising even to the surface. A heavy surf thus frequently breaks from land to land; and even under the most favourable circumstances no vessels drawing more than twelve feet water can enter the river.

The bay of Limon, on the contrary, is about five miles wide at the entrance, and can be approached by night or day, in any weather, there being no danger unless quite close to either shore. Its opening is due north. On the western side several projecting points afford secure and commodious anchorage within them, the innermost inclosing what is at present considered the harbour, but which a break-water, formed, at little expense, of the coral rock which abounds on the shores, and which has been already noticed (p. 71), would enlarge to any extent that could be required. The bottom of the bay curves regularly, bounded by a beach of very tenacious sand, and beyond by a bank, raised a few feet above high-water mark, and formed of shells thrown up by the surf, which, in strong northerly winds, breaks here with some force. About three miles from the east point of the bay the land falls back in another deep curve, within which is situated an island called Manzanilla, a mile and a quarter long and a mile broad, forming a fine channel with the main land, with excellent anchorage for large ships for some distance within its entrance,—and shelter for small vessels to repair or careen, in a large lagoon inclosed between the main land and the south-eastern end of the island. The depth of water in the bay decreases regularly from six fathoms to three, two, and one and a half even close to shore; and its value as an anchorage is already well known to British vessels on the coast, from whose visits it has acquired the name of Navy Bay. Along its shores the land is first studded with cocoa-nut trees, which are succeeded by mangroves, and these again by the dense forest. The climate is comparatively healthy, and the fall of rain moderate, even at present; but when the adjoining woods are more cleared, there is little doubt that it would be still further improved in both respects.

To this bay the Chagres approaches in its course to within two miles and a half, the internal being perfectly level, with the exception of a few abrupt eminences from forty to sixty feet high. The soil is a stiff clay, covered with stunted wood, and intersected by a few rivulets, or *quebradas*, which in summer are still water, and somewhat brackish. A canal cut in the most favourable direction would come out near the Rio Indio; and as about this point the

mean height of the river is nearly that of the ocean, no locks would be required, and the supply of water would be certain and economical. Once on the Chagres, the navigation, as has been already noticed, is easy to the Trinidad; from which, to Chorrera and Panamá, Mr. Lloyd's lines are across the interval between the several portions of the cordilleras, where the country is, almost without interruption, low and flat.

The present roads, on the contrary, are not merely objectionable for the reasons already stated, but also from the mountainous nature of the country which they traverse. That between Panamá and Porto-Bello is, in this respect, greatly the worst of the two, being in many places almost impassable in the rainy season, from the steepness of the ascents and descents, none of which are sought to be avoided. But the roads to Cruces and Gorgona also lead across a mountainous country, and are extremely difficult in bad weather: a considerable portion of the latter, indeed, being merely the bed of what is in winter a considerable stream.

Panamà.—The site of Panamá has been once changed. Where the old city stood, which is about three miles east of the present situation, was already, when the Spaniards first reached it in 1515, occupied by an Indian population, attracted to it by the abundance of fish on the coast, and who are said to have named it 'Panamá' from this circumstance,—the word signifying, in their language, 'much fish.' They, however, were speedily dispossessed; and even so early as in 1521, the title and privileges of a city were conferred on the Spanish town by the Emperor Charles V. In the year 1670, it was sacked and reduced to ashes by the buccaneer Morgan; and was only after this built where it now stands.

Its present position is in latitude $8^{\circ} 57'$ N., longitude $79^{\circ} 30'$ W. of Greenwich, on a tongue of land shaped nearly like a spear head, extending a considerable distance out to sea, and gradually swelling towards the middle. Its harbour is protected by a number of islands, a little way from the main-land, some of which are of considerable size, and highly cultivated. There is good anchorage under them all, and supplies of ordinary kinds, including excellent water, may be obtained from most of them.

The plan of the city is not strictly regular, but the principal streets extend across the little peninsula from sea to sea, and a current of air is thus preserved, and more cleanliness than is usually found in the Spanish American towns. The fortifications are also irregular, and not strong, though the walls are high,—the bastions having been constructed, from time to time, as the menaces of pirates or other enemies have suggested. The buildings are of stone, generally most substantial, and the larger with courts or patios. The style is the old Spanish. Of public edifices there are

a beautiful cathedral, four convents (now nearly deserted) belonging respectively to the Dominican, Augustin, Franciscan, and Merceuaros monks; a nunnery of Santa Clara, a college *de la Compañia*, and also the walls of another, which was begun on a magnificent scale, but was never finished, and is now falling to ruins.

Immediately about Panamá, east along the coast, and north-west from it, the land is low and flat; but west and north-east the mountains approach it closely: and from a hill, called Cerro Ancon, about a mile west from the city, and six hundred feet high, an excellent bird's-eye view is obtained of the whole adjoining country, including the city, the islands in the bay, the neighbouring plantations, the mountains of Veragua, the Pearl Islands, the flat country towards Chagres, the elevated chain between Porto-Bello and Panamá, the Rio Grande, the low land along the coast towards the Pacora and Chepo, Panamá Vieja, &c., all which come successively under review, and together constitute a landscape beyond measure beautiful.

Porto-Bello—Was first discovered in 1502 by Columbus, who thus named it from the excellence of its harbour. It is situated in lat. $9^{\circ} 34' 35''$ N., long. $77^{\circ} 45'$ W., close to the sea, at the foot of immense mountains, which surround the whole port;—and consists of one long street, which circles round the bay, with a few short ones branching off where the ground will admit of them. There are, besides, two *plazas*, or squares, one in front of the Treasury, which is built of stone; the other formed on one side by the church, which is also of stone, and capacious, relatively to the population, but of late years it has been allowed to go very much to ruin. The same may, indeed, be said of all the public, and most of the private works: the hospital, and even the fortifications, are dilapidated, and of the houses in town only a few remain tenatable.

It has been already noticed that animals brought from other countries speedily degenerate and cease to produce here; even the fowls sent from Carthagená, or Panamá, shortly giving up laying eggs. All the meat that is consumed is thus sent from Panamá, or from some of the *hatos* on or near the road; and if not immediately killed the animals become emaciated, and their flesh little better than carrion, though there appears plenty of excellent herbage in the vicinity of the city. For this reason, although in every other part of the country there are numerous cattle estates, not one is to be found in this vicinity; and the only animals that appear to thrive are pigs and mules.

The heat is generally most oppressive. The town being surrounded by mountains, the freshening sea-breeze is never felt; and the immense forests that cover the mountains, and indeed the face of the whole country, precluding the passage of the sun's rays to

dry the earth, the most dense vapour is continually exhaling, which ascends and forms immense clouds, deluging the country with almost incessant rains. The sun occasionally bursts out with the greatest fierceness, but before it can have had any but a mischievous effect, even to dry the streets, it is again enveloped in clouds; and again it rains, clearing up, and raining, in such rapid succession, morning and night, that the heat is seldom moderated.

The dampness and unhealthiness of the climate, combined with the heat, and the immoderate use of spirits, soon succeed in so enervating the constitution, that the first attack of an epidemic is generally fatal; and though medical men of eminence have occasionally been induced to settle in Porto-Bello, they have seldom found their medicines and learning sufficient to guard even themselves long against the effects of the climate. The city has thus acquired the title of ‘*La Sepultura de los Europeanos.*’

The population is now extremely limited—the greater part being negroes and mulattoes, with one or two old Spaniards, who still cling to their property here. Occasionally a few visitors arrive from Panamá, with goods, which they dispose of at an exorbitant price; and a small detachment of troops is sent from Panamá to do duty for a certain time. But this is frequently relieved; and the survivors look forward with great joy to the day on which they are allowed to depart.

The waters that run from the different mountains are particularly clear, and delicious to drink; but wo to the person who is rash enough to make immoderate use of them, their very excellence being their misfortune, as they cause dysenteries, from which few escape; and almost all the fevers of the country degenerate into this disease. They, however, afford the luxury of a cool and refreshing bath, which every one takes a little before noon; and it is considered one of the most important occupations of the day.

As the mountains and forests, which abound with animals of various descriptions, extend to the very foundations of the houses, it is not uncommon to find wild hogs and small tigers near the town, and the latter sometimes make inroads on the fowls and other domestic animals. They are anxiously sought after, however, by the negroes and mulattoes, who frequent the forests as wood-cutters, and are particularly expert in attacking tigers, generally with no other arms than a lance and a machete, or very long sabre-like knife. With these they seek their hiding-places; and, encountering one, with the left arm enveloped in a blanket they with the lance incense the tiger to make a spring, when they wound him in the tendon of the paws if possible, which makes him retire. The hunter pursues, and generally succeeding in again

cutting the paws, afterwards despatches him at his leisure,—carrying his head, paws, and skin to Porto-Bello, as a trophy of his valour, and preserving the skin to make tobacco-pouches, or covers to little easy chairs used in the country.

The great abundance of toads about Porto-Bello has been already noticed. This is so prodigious after rain, that the popular prejudice is, that the drops are changed into toads (*de cada gota viene un Sapo*); and even the more learned maintain, that the eggs of this animal are raised with the vapours from the adjoining swamps, and, being conveyed to the city by the succeeding rains, are there hatched. Their large size, however—many of them being from four to six inches in breadth—sufficiently attests their mature growth in more favourable circumstances. After a night of rain, the streets are almost covered with them, and it is impossible to walk without crushing them.

Chagres.—The town of Chagres is one of the most miserable that can be imagined, being situated in a little sandy bay on the north side of the river, open to no wind but a westerly one, and bounded by woods to the south, by a black and dismal-looking fortification on a hill to the north, and by a swamp to the east, which is continually fed by springs which have no outlet. It also is thus extremely unhealthy. The inhabitants are chiefly black, or coloured, with the exception of a few custom-house officers, and the commandant of the castle. Their number is about one thousand. In entering the river from the sea, the town is not seen till close upon it; and does not look better than a collection of negro huts on a West India sugar plantation, the houses being chiefly built of mud, and thatched.

Gatun, Gorgona, Cruces, &c.—Gatun is quite a small village. Gorgona is somewhat larger, being a point where passengers going to Panamá frequently land, in order to avoid the danger and delay caused by the progressively increasing rapidity of the current, as boats ascend to Cruces. Cruces, however, is the place to which goods are always conveyed, and was a village of considerable extent when Mr. Lloyd first saw it, but was accidentally burned down in 1828. When he left it, there were not more than one hundred and twenty houses, built of reeds, occasionally plastered, and neatly thatched. The inhabitants of these places are nearly all owners of canoes or mules,—or store-keepers for taking charge of goods,—or bogas, that is, persons employed in working the canoes, which is done either by paddles or poles, according to the depth of water. Cruces and Gorgona are also resorted to as watering-places in summer by the inhabitants of Panamá, being considered very healthy; and the town of Chorrera, on the river of that name, falling into the Pacific, has the same advantage

Gold Mines.—Mr. Lloyd visited the gold mines of Santa Rita and Pequeni, both in the mountains of Porto-Bello, but could discover nothing but a few shafts, or rather holes, of little depth, which if they ever were productive, seem now exhausted. He very much doubts, indeed, whether the places shown him as the mines are really those where (according to tradition) large quantities of ore were once obtained; and thinks that some deception was employed,—probably to deceive the Spanish government—when they were in activity. They are now almost abandoned.

III. STATISTICS.

The present department of the Isthmus is divided into two provinces, viz. Panamá, which includes the Darien, and Veragua; and these again are divided into cantons, having a certain number of parishes in each, as follows, according to a census taken in 1822.

PROVINCE OF PANAMA.

CANTON OF PANAMA.		CANTON OF LOS SANTOS.	
	Inhab.		Inhab.
Panamà, capital of department	10,730	Los Santos, capital, distant from Panamá fifty-three leagues	4318
Parish of Pacora	657	Parish of Parita	2170
„ Chepo	1933	„ Sn. José de Peré	3142
„ Chiman	238	„ Pocri	1939
„ Sn. Juan	174	„ Macaiacas	2338
„ Cruces	1200	„ Las Tablas	3577
„ Gorgona	549	„ Baca Monte, or Sta. Barbara	1141
„ Taboga	543	„ Pedasi	1544
„ Pearl Islands	700	„ Ocú	1179
	<hr/> 16,724 <hr/>		<hr/> 21,348 <hr/>
CANTON OF CHORRERA.		CANTON OF NATA.	
Chorrera, the capital, distant nine leagues from Panamá	4000	Natá, the capital, distant forty-two leagues from Panamá	4262
Parish of Areyjan	834	Parish of Anton	1281
„ Capira	1000	„ Sta. Maria	2562
„ Sn. Carlos	577	„ Penonomé	8643
„ Chame	1000	„ Ola	360
	<hr/> 7411 <hr/>		<hr/> 17,108 <hr/>

CANTON OF PORTO VELO.

Porto Velo, the capital, considered to be twenty- two leagues from Panamá	1122
Parish of Sta. Rita . . .	76
„ Chagres . . .	856
„ Palenque . . .	312
„ Pta. Gorda . . .	59
	<hr/>
	2425
	<hr/>

CANTON OF DARIEN.

Tavisa, the capital, distant thirty-eight leagues from Panamá . . .	341
Parish of Sta. Maria . . .	245
„ Fichichi . . .	100
„ Pinogana . . .	146
„ Molineca . . .	35
„ Facuti . . .	113
„ Cana . . .	30
„ Chipigana . . .	162
	<hr/>
	1172
	<hr/>

PROVINCE OF VERAGUA.

CANTON OF SANTIAGO.

Santiago, the capital of, dis- tant from Panamá sixty leagues . . .	4568
Parish of Jesus . . .	1276
„ Montijo . . .	1182
„ Punaga . . .	509
„ Sn. Francisco de la Montaña . . .	4387
„ Atalaya . . .	785
„ Calobre . . .	1463
	<hr/>
	14,170
	<hr/>

CANTON DE LA MESA.

La Mesa, the capital, dis- tant — leagues from Panamá . . .	4451
Parish of Cañasas . . .	2542
„ Palmas . . .	545
„ Soná . . .	1184
	<hr/>
	8722
	<hr/>

CANTON OF REMEDIOS.

Remedios, the capital, dis- tant — leagues from Panamá . . .	1800
Parish of Tolé . . .	409
„ Sn. Feliz . . .	324
„ Sn. Lorenzo . . .	2477
	<hr/>
	5010
	<hr/>

CANTON OF ALANGE.

Santiago de Alange, the capital, distant — leagues from Panamá	2611
Parish of Sn. David . . .	2385
„ Sn. Pablo . . .	312
„ Gualaca . . .	842
„ Biyaba . . .	242
„ Dolega . . .	739
„ Boqueron . . .	334
	<hr/>
	7465
	<hr/>

SUMMARY.	
Canton of Panamá	16,724
„ Los Santos	21,348
„ Chorrera	7411
„ Natá	17,108
„ Porto Velo	2425
„ Darien	1172
<hr/>	
Province of Panamá	66,188
Canton of Santiago	14,170
„ La Mesa	8722
„ Remedios	5010
„ Alange	7465
<hr/>	
Province of Feragua	35,367
<hr/>	
Total number of inhabitants in the government of the Isthmus in the year 1822	<u>101,550</u>

Most of these cantons are alike in their resources and agriculture (with the exception of Porto-Bello and Darien, which are almost uncultivated), but distinct reports of the produce of each were not procured. The following specification, however, of that of the canton of Los Santos, in 1827, may serve as an example with regard to cultivation; and a census of the parish of San Francisco de la Montaña is also subjoined.

STATE OF THE CANTON OF LOS SANTOS IN THE YEAR 1827.

Canton of Los Santos.	Men.	Women.	Deaths.	Marriages.	Born.	Slaves.	Houses tiled.	Houses thatched.	In the Country Houses thatched.	Cattle.	Horses.	Mares.	Mules.	Goats.	Maiz, or Corn.	Rice.	Sugar.	Molasses.	Slaves.	Grease.	Pigs.	Cotton.	Salt.	
Santa Barbara .	612	689	19	9	42		74	92	14	188	900	133	73	24	7	8000	90	qts.			20	18	qts.	
Macaracas	1769	1882	87	16	145	7	136	342			2000	300	40	20	16	200	220	6	100	60	7	50	4	
Pedazi	214	214	11	8	16	2	23	110			936	140	184	3	65	210	928	102			18			
San José de Perú	1753	1848	102	32	216	17	78	116	63	685	4846	1300	900	85	150	6200	2720	50	246		140			
Ocú	854	985	101	24	198	11	24	48	2	250	3669	222	616	47	26	1500	48				97	10		
Las Tablas	1880	1998	104	12	112	34	163	8	312		7850	1230	3635	23	527	2280	2000	260		500	60	80		
Pocri	998	1013	81	11	90	6	31	54	27	506	3300	390	220	6	112	3600	2950	450			900			
Parita	1189	2237	43	14	110	98	166	489			7900	649	1576	28	196	1100	650	96	380	420	115	9		
Los Santos	1956	3776	183	33	131	30	684	265			8321	7200	2300	47	220	1000	500	8	800	405	300	11	1800	
	11225	11642	736	142	1060	295	1379	1524	418	1629	30721	4564	9544	283	1319	24090	9998	420	2078	1385	147	1715	52	1800

Census of the town of San Francisco de La Montaña, in Veraagua, for the year 1825.

	White.		Coloured.		Total.
	Men.	Women.	Men.	Women.	
St. Francisco.	2896		2448		5344
Baptized .	63	64	28	53	208
Died	10	15	19	14	58
Married. .		10		15	25

With regard to the above tables, Mr. Lloyd observes that the division into white and coloured is not strict, as most descendants of mestizos, and even mulattoes, if their circumstances are easy, are considered white. And also, that the excess of baptisms over deaths in the second table, multiplied by the five years intervening between its date, and that of the previous census, will not give the whole difference between the respective numbers:—whence he considers it probable that all those in the first are under-stated, and may be increased in the same proportion, in order to give the population in 1827. Some other observations, however, also occur respecting these tables; and may be advantageously interwoven with the additional facts to be yet adduced.

It may reasonably be doubted, perhaps, how far tables of such extreme minuteness regarding a thinly-peopled, and by no means highly-civilized district, are quite so correct as they pretend to be;—but supposing them to approach the truth, a very remarkable disproportion is first observable between the males and females, both in the human species, and, as may be worthy notice, among brutes also, the return of men in Los Santos, in 1827, being 11,225 to 14,642 women; and of horses 4564, to 9544 mares. Of the first, above a half were whites, or so considered, all being creole, or born in the country. The remainder were coloured, chiefly Indians, condemned, by their position in society, to servile labour, at a low rate of wages and subsistence, but not slaves;—of which latter the return only gives 295 (probably Africans, but not so stated), out of the whole 26,000 inhabitants in the province. The deaths in 1827 were only one in twenty-eight, a very small mortality in a tropical climate; and confirming Mr. Lloyd's previous statements of the healthiness of the western districts of the department. The births were one in twenty-six persons, or thirteen couple,—the marriages were only one in 174 persons, or 87 couple. And they were more numerous among the coloured, than among the white population.

One person in every five had a house, or, in other words, the average number in a family was five, which may be thought to indicate a slow increase. Accordingly, the excess of births above deaths in Los Santos, in 1827, was only 324, one seventy-second part of the population, or about one and a half per cent. In the United States the increase exceeds three, and approaches to four per cent. Of the houses, a very large proportion, almost a half, are marked as houses in the country, indicating at once security, and the prevalence of agricultural occupation: two-thirds are stated as 'thatched houses,' the remainder as 'tiled.'

The column marked 'cattle' includes both oxen for draught and slaughter. The breed is of good size; and the draught-oxen, when well broken, fetch from twenty-five to thirty dollars each. Those for slaughter may be bought at from twelve to eighteen dollars each, the best. The race of horses is small, but hardy; and their price varies from fifteen to forty dollars. Mules are said by Mr. Lloyd to be the animals most prized in the country, yet the return of their numbers in the canton of Los Santos, in 1827, is so small, as strikingly to illustrate his previous statement as to the flatness of the country in this direction; for in mountainous districts, it is well known, no other animal is ever rode. Their price varies from twenty, even to 120 dollars. The number of goats is also very small, which, at first sight, seems merely to confirm the same fact; but when it is considered that, throughout the West Indies generally, this animal supplies the place of the sheep for the table, and in some degree also that of the milch-cow for the dairy, its rarity here leads to a further induction. Pigs are few, and of most exorbitant value; of a good size and well fattened, they will fetch from thirty to thirty-five dollars each; and are chiefly purchased by women butchers, who, after killing them, cut off every morsel of fat, and sell it separately as lard for culinary purposes.

Fish and fowl are plentiful, cheap, and much used; and in Panamá market, hundreds of young sharks, of the kind called shovel-nosed, and from one to two feet and a half long, are daily sold for food. The guana* is considered an especial dainty, as are pearl oysters, and many varieties of game, which are brought in

* Thus described:—'It has much the appearance of a small alligator, of a yellowish green colour, and is very common along the banks of all the rivers, living chiefly on fruit and leaves of trees. It has a peculiar power of running on the top of water, which it does with great rapidity, and apparently with the greatest ease. Its claws seem, indeed, formed for the purpose, having a membrane, or web, resembling that of the duck.

'The eggs of these creatures, when dried, are considered a great luxury. They are little larger than a boy's marble, and have nearly the same flavour with turtle-eggs. The flesh itself resembles that of the fowl, both in appearance and taste. The Mosquito-Indians occasionally come to the river Chagres, in companies of twenty or thirty, to hunt the guana, which they do with great expertness, chasing them into the trees with small dogs, and shooting them with fowling-pieces. The Americans have taught them to know and use these both with percussion and other locks.'

from the woods. Even monkeys are eaten, especially in the country bivouacs, though seldom offered for sale in the town markets.

The chief articles of farinaceous food are maize, or Indian corn, and rice; yet the home growth of each seems very moderate. They are peeled, or shelled, by hand, in a rude mortar, made by hollowing out a piece of a large tree; and the operation is so troublesome as to make a great difference in the price of the article before and after it is performed.

The greater part of the sugar used in the Isthmus is imported in skins from Central America, or from the Valley of Cauca, by way of Buenaventura, on the Choco Coast. It is thus dear. The home produce is chiefly miel, or molasses, and raspadura, or pan-sugar, which are preferred by the inhabitants to the finer preparations. Great quantities of wild honey are found in the woods, the bees collecting which do not sting, and are thus robbed without precaution. No return is made of the manufactory of ardent spirits.

Mr. Lloyd thinks that the Statistical Table, given above, of the province of Los Santos, may be considered generally as descriptive of the others also, with the exception of Darien and Porto-Bello, which are comparatively uncultivated, and of Panamá, in which the vicinity of the capital city gives a preponderance the other way. In general, however, he adds, the western and central districts, with the islands in the bay of Panamá, are the best cultivated and most populous, Los Santos being one of them. Elsewhere the landlords keep their estates chiefly in grass to save trouble; and the population is nowhere industrious, though strong, and enduring, under occasional fatigue.

Their indolence, it is added, is not to be attributed wholly to the climate, or their own original constitution, but chiefly to the extreme fertility of the soil, and the comparative ease with which a man and his family can derive subsistence from it. With a gun and axe individuals, otherwise unprovided, take up their residence in any corner of the woods, and in two or three days will have erected a substantial hut, with upright posts and cross-pieces, as firmly fastened with vines as any nails or clamps could make them, and thatched with the split branches of the wild palm-tree, one of the best materials possible against either wind or rain. The family, at their leisure, then form a stage or second floor, to which a piece of balsa, cut with notches, serves to ascend; and a few stones for a fire-place, an iron cooking-pot, and some pieces of wood to sit on, complete the establishment. The nearest trees to the habitation are cut down, fire is applied to the more distant, which, after burning some days, leaves the ground ready for a crop; advantage is taken of the first rainy season to get in the requisite seeds; and for everything else implicit reliance is placed on the gun. None of these people stir, even to work, without this their constant companion (generally an old musquet); and in an hour or two they are

certain of bringing down as much animal food as they can consume in a week, with sufficient, besides, to barter at the nearest village or town, for rice and plantains.

With the indolent habits thus acquired by the free population, and the very small number of slaves in the department, it will appear difficult at any time to command the requisite amount of labour for public purposes; and the actual bad state of the roads seems to demonstrate that this, among other obstacles, is really felt to stand in the way of great improvements. Mr. Lloyd, however, is of opinion, that this difficulty would not be insurmountable were a considerable work, of undoubted public utility, (as, for example, cutting his new line of road between the two seas,) to be undertaken by a powerful company. 'There are within the province,' he says on this head, 'several regiments of militia formed of the lower classes of people and Indians, excellent workmen in felling timber and clearing ground, and particularly apt in acquiring any mechanical art. They have advantages over Europeans which, from the nature of the climate, will always exist. Their habits are most simple: with a piece of *tasajo* or dried beef, a few plantains, and some rice, they are provided with the sustenance on which they live from youth to age; and with a skin in their huts on which to sleep, and a block of wood to sit on, their establishment is complete. Their dress never alters, winter or summer; it consists of a short brown holland or check shirt, and a pair of *caljonjillas*, or drawers, reaching to the knee (which are generally cast off when at work); shoes are known to them only as articles of great luxury; they seldom want anything to protect their feet, and if they do, a piece of hide is used, cut and tied very neatly as a sandal. Their common wages are from two to three reals a-day (from 1s. to 1s. 6d.), with their meals, which, as they are fed, may cost about 4d. per day more. These men, there is no doubt, the government (under particular circumstances) would gladly place at the disposal of a company, with individuals to command and keep them in order; and in one instance this has been already offered, though not accepted, to the extent of one thousand men.'

Trade.—The trade of the isthmus is at present at a very low ebb. On the Atlantic shore it is maintained with Jamaica by a British man-of-war, which sails every month, between the 20th and 28th, for the express purpose of carrying letters and specie,—with Carthagena, by government vessels, twice a month,—and with the same, and a few other points, by independent traders, which bring freight to Chagres, and exchange them. On the Pacific it embraces all parts of the coast, both north and south, which find it their interest to communicate with Europe in this way.

The expense of conveying specie across the isthmus to be embarked at Chagres is as follows:—A mule will carry five thousand

dollars or ounces, and its hire from Panamá to Cruces is six dollars; the municipal duty is one dollar, and another called *Piso* is two reals. From Cruces to Chagres the freight for the same sum is one and a half dollars; the portage at Chagres is as much more; and the whole charge on it is thus ten dollars two reals, besides a transit duty of three per cent. on silver and one per cent. on gold.—The return trade in goods is at the following rates:

The water-carriage from Chagres to Cruces is two dollars the bale; and warehouse room in Cruces two reals more. Thence the goods are carried to Panamá, either on mules, or by natives on their shoulders, as the case may be. If the packages are heavy, but strong and compact, mules are employed; but if liable to breakage, or of inconvenient shape for passing carelessly along narrow lanes, and up and down steep acclivities, men are considered the most trust-worthy and careful animals. The hire of a mule is, according to the burthen and measure, from four to six dollars; and of a porter, from six dollars upwards, by the same rule. On the arrival of goods at Panamá, they are immediately lodged in the custom-house; and if for exportation, pay a duty of two per cent. If for home consumption, it is according to the article. And to all these expenses must be added about four dollars on the bale, for extra packing to defend from rain; making in all from ten to twelve dollars.

In the year 1825 the following vessels were entered at the Port of Chagres, exclusive of men-of-war, packets, and small coasters: viz. one large ship from Bordeaux; seven brigs from Havre de Grace; twenty-one schooners, chiefly British, from the West Indian islands; six schooners from the United States; and three from Carthage. In 1828, these numbers had diminished to eleven schooners from the West Indies; four from Carthage; and five from the United States, without any French whatever, and it is not believed that the trade has since much revived.

In the same year the entries at Panamá were respectively seventeen and twenty-four vessels; the lesser number, on the one side, corresponding to the greater number on the other, and *vice versa*. This would seem to indicate that the whole transit might, with patience and perseverance, be considerably improved, but the spirit of commercial enterprize, which in 1825 was too rash, has ever since been altogether as desponding. The improvement is chiefly exemplified in the trade with Guayaquil, which exhibits only one entry in 1825, and no fewer than eleven in 1828. The passage from Callao to Panamá takes usually from nine to twelve days. From Panamá to Chagres it occupies three; and from Chagres to Jamaica six to ten.

Finances.—The following is a statement of the receipts and expenditure of the government of Panamá, in 1827.

RECEIPTS.

Balance from the last Year	4,526	7	1
Amount received for Stamped Paper	1,090	3	1
From Provincial Treasuries	1,811	0	0
Donations, or Voluntary Contributions	49	0	0
Assignments	6,000	0	0
Ninths—a species of Tithes	5,161	6	1
Loans	86,820	0	0
Apovechamientos, or from Public Lands	5,447	3	1
Reintegroes, or Restorations	939	3	1
Custom House Duties	70,008	3	1
Duties on Tobacco	15,820	2	1
Duties on Spirits	564	1	1
Record Office	491	5	0
Vacantes?	7,264	4	1
Auxiliaries to the National Credit	1,473	2	0
Capitation Tax	4,569	1	1
Deposits	29,704	7	1
	241,682	6	0

Mr. Lloyd adds, 'Under the above head of loans, only 22,800 dollars were paid in cash; the rest was, 11,789 for rations in meat for the troops—2653 in documents to persons holding official situations on account of the scarcity of money—27,773 advanced by merchants to the military, for which they received documents on the Custom-house.'

EXPENSES.

Expenses of the Hospital	18,406	7	1
Expenses in Stamping Paper	1,302	1	0
Aid to other Treasuries	5,936	1	0
Returned to Money Lenders	83,582	2	0
Paid by Custom House	277	4	5
Paid to the Collector of Tobacco	1,429	0	0
Paid to Invalids or Retired Officers	3,589	5	1
Novenos Decimales	1,720	2	1
Salaries of Public Officers	7,514	0	1
Ditto of Treasury	4,546	6	1
Pay to the Military	84,792	1	1
Expenses of Ecclesiastical Meetings	1,225	3	0
General Expenses	10,475	2	0
General Expenses of Fortifications	1,756	2	1
Artillery, or Arsenal	2,616	3	1
Vacantes	2,583	2	0
Monte Pio, or Fund for Relieving Government Officers	410	2	0
Lepers' Hospital	79	0	0
Repaid to Persons depositing Money	2,283	2	1
Sundries	617	0	0
Ditto, Credito del Gobierno. Español	3,788	2	1
	238,920	6	0
Balance in the Treasury	2753	0	0

The following account of the income in 1812, may be advantageously subjoined, as showing what has been, for the present at least, lost, and altered, by the separation from Spain.

INCOME OF PANAMA FOR THE YEAR 1812.

Sealed Paper	2,210	Ecclesiastical Duties in other Cantons	420
Ecclesiastical Duties	5,332	Pope's Dispensation Bulls	27,000
From Alcaldes	79	Ditto, distributed	5,000
Custom House	145,000	Other Bulls for Sins	7,000
Quinto, or Duty on Gold and Pearls	778	Ditto	1,500
Tribute by the Indians	303	Duty on Tobacco	2,000
From other Treasuries	19,858	Ditto on Cards	2,600
From Hospital	536	Turnpikes	1,300
For Invalids (Monte Pio)	2,623	Voluntary Contributions	110,000
Seizures	800	Received to assist in carrying on the War	31,000
Reintegros	175,160	Customs on goods in Cruces	4,000
Borrowed	42,500	Military Monte Pio, or Fund	4,500
Duties on Aquadiente	21,200	Munisterial ditto	1,400
— Powder	2	Received for Clothing of Militia	5,000
Deposits	101,000	Monte Pio for Surgeons	251
New Duty on Aquadiente de Lima (from Peru)	2,000	Extraordinary Contributions	9,000
Fines	1,200		
Received from Spain for Fortifications	10,000		
Ecclesiastical Duties in other Cantons	2,782		
			<hr/> 746,241 <hr/>

Manners, Education, Occupation, &c.—The upper classes in the Isthmus are of the common stock, but by no means so far advanced in civilization as their neighbours. The white people, and particularly the women, are noted for a tinge of European complexion, which can hardly be reconciled with their geographical position. They are the most superstitious, and the least freed from the shackles of their religion, of all the Columbians; and thus, although their communication with the English is considerable, and they admire and profess to imitate our domestic habits, we are not in general favourites with them.

The women are retired and even unsocial, scarcely ever leaving their houses but to mass, or to follow in a religious procession. They are also altogether uninformed, and rear their children in the worst manner, allowing them to associate indiscriminately with the lowest negroes of their own age. Hence, though there is a college at Panamá, the head of which is a most excellent, well-informed clergyman, and considerable pains are here taken to instruct the youth in mathematics, natural philosophy, and other, the higher, sciences,—yet the formation of their character, and the instilment of honourable principle, and right feeling in them, are neglected; and billiards, cockpits, gambling, and smoking in low company, are their exclusive amusements. It is not probable,

therefore, that the worst features of the male character here will be speedily corrected, which are, indifference to the pleasures of home, and a propensity to low debauch abroad. Their best quality is great liberality to the poor, and especially to the aged and infirm; of whom almost every family of consequence has several regular pensioners, who come every Saturday to receive an accustomed and liberal alms.

A considerable turn for commerce is observable among the inhabitants of Panamá; and from the highest to the lowest, each keeps a shop or tienda. The lower classes also pursue different handicrafts; but are rude in all, excepting in goldsmith's work, for one branch of which, viz. plating gold chains, they are famous. The field for this branch of art, however, as for every other connected with luxury, is now much curtailed. At one time, no family in Panamá ate off any thing but plate,—almost every domestic utensil was of the same material, and the women wore a profusion of chains, pearls, and other ornaments. But these have now, for the most part, disappeared, and even much of the church plate has progressively passed through the melting-pot to the old world, although, on peculiar gala-days, an attempt is still made by some individuals to reappear in the former style.

The dress of the women is, on these occasions, peculiarly splendid, being what is called 'Cartagenea,' thus described by Mr. Lloyd. 'A loose shift of beautiful cambric, with innumerable and immense frills richly worked with lace, is, with a petticoat of the same, fastened at the waist by several massive, chased, gold buttons. Round the neck are several gold chains, with pearl rosettes, crosses, and rows of pearls; the earrings are of the shape of a telegraph, and reach nearly to the shoulders; the fingers are covered with rings; and various combs, studded with rows of pearls, cased in gold, are placed, together with a massive gold bodkin, to great advantage in beautiful hair, plaited in two tails down the back. The feet are barely introduced into a little slipper, turned up very much at the toes, and also richly ornamented. The whole effect is elegant and becoming.'

The pearls thus tastefully disposed round the person of a fair Panamenian are, it is well known, procured among the islands of the coast, by diving. The occupation is very laborious, and success most uncertain; but the pursuit is a favourite one, and the divers are very expert. They generally proceed in companies of several canoes together, each containing six or seven men, who dive in succession armed with a sharp knife, rather for the purpose of detaching the oysters from the rocks to which they adhere, than for defence against danger. Before descending they repeatedly cross themselves, and generally bring up four oysters, two under

the arm, and two in the hand. The usual time of stopping under water is from fifty seconds to two and a half minutes. Much has been said of the danger of these fisheries, both from the shark, and another enemy called the Mantá, which crushes its victim. 'But the shark is ever a coward; and so little of a match for an expert diver with a knife, that an accident is hardly known.'

Many individuals in Panamá have made it their occupation for years to collect, in this way, pearls for the formation of necklaces: some of which, after continued changing and labour, are certainly of the most perfect symmetry. But their price is not reckoned according to the marketable value of such articles, but according to the trouble which may have been bestowed in collecting and assorting them; and thus they are often dearer on the spot than in London. Some time ago a diving-bell was sent out by an English company for pearl fishing, but it did not answer their expectation, and several causes may be assigned for its failure. The first and primary was the enormous expense at which the concern was fitted out and supported; after which it was found, that the oysters did not lie in banks, as is generally the case, but were dispersed under rocks and in uneven ground: and that a peculiar ground-swell and motion under the water, with a very strong current, made it almost impossible to place the bell in safety, and to advantage.

IX.—*Memoir on the Voyage of his Majesty's ship Blonde in the Black Sea.* By the Rev. Edmund Goodenough, D.D., F.R.S., &c. Read 28th March, 1831.

OF all the waters of the deep which have been penetrated by the enterprise of British sailors, there are none so little known to us, by actual observation, as the Black Sea. Although it appears, by a memorial presented to the Turkish government on the 1st of September, 1799, by Mr. John Spencer Smith, that both in the times of Queen Elizabeth and of Charles II.*, British merchantmen were permitted to navigate the Euxine throughout its whole extent, for the purposes of commerce; yet the most copious naval histories of our country do not afford a single instance of a ship of war, antecedent to the short excursion made by his Majesty's ship *Blonde*, in November, 1829, having been permitted to navigate the Euxine; and even the multifarious record of the valuable old *Purchas* affords us only two instances (which were pointed out to me by my friend Mr. Barrow) of Englishmen having traversed any

* See Appendix to Dr. Clarke's Travels.

portion of this sea. The one is of 'Master John Newberie,' who embarked at Tarrapea (Therapia) on the 6th of April, 1582; was for some days in the harbour of Siseboli, into which he was driven by stress of weather; anchored again under Cape Eminéh; passed Varna, and 'a castle called Caliacca, which standeth upon a cape of land,' manifestly what is called Calagriah upon our charts; and finally entered the Danube by the mouth called Licostoma, where they had only eight feet water; and so proceeded into the interior of the country. The narrative of his voyage is altogether barren of geographical or other useful remarks.

The other instance is that of Captain John Smith, a military adventurer, about the year 1596, whose history is curiously tinged with the romantic spirit of the times. Having been taken prisoner by the Turks, in a victory they obtained against the Christians, and being recognized by his armour as a person of some consideration, he was sold in the market to a bashaw, who sent him to Constantinople, 'as a present to his fair mistress,' for a slave. Upon conversing with him, and trying him in several languages, and finding that he was an Englishman, and a man of various information, 'she took much compassion on him,' but not so as to put him into the dangerous predicament of becoming enamoured of his person; for we are told, that 'having no use for him, lest her mother should sell him, she sent him to her brother, the Tymor bashaw of Nalbrits, in the country of Cambrya in Tartaria;' so he went by land to Varna, and from thence across the Black Sea to the two capes of Taur and Pergillo, the former of which we may suppose, from its name, to have been in the Crimea, and thus extended his adventures into Tartary. Under these circumstances he cannot be expected to give us any great information respecting the sea he crossed; but still we shall have occasion to refer again to his account for one peculiar fact of which he was a witness.

Such, therefore, being the paucity of British adventure in this sea, it may not be deemed improper to put the fact of the Blonde's voyage, which forms so unique a feature in our naval annals, into some more durable shape than that afforded by the daily journals. From the prevalence, indeed, of the plague, and consequent necessity of quarantine wherever she touched, together with the jealousy of the local Russian authorities, who seem to have been sufficiently alarmed at the apparition of this unaccustomed stranger, the account of her voyage presents us with little or nothing of discovery, or interesting adventure: and, in the absence of such exciting topics, I may perhaps be the more readily excused, if I combine with the subject a brief notice of some of the opinions, transactions, and settlements of the ancients, in this sea. Although of comparatively small importance in modern European history, it

was to them a place of much resort, the scene of some of the earliest adventures of their poetical history, an ample field for their favourite practice of colonization, and the emporium from which they procured many of the luxuries and necessities of life.

Neither the barbarians of the western or northern shores, nor the Asiatic potentates on its southern and eastern banks, could exercise dominion over the Euxine; yet they who have held Constantinople and its canal have at all times, from their geographical position, possessed the greatest influence over its navigation and commerce; and although this very position, and the facility which it afforded of exacting tribute from foreign merchants, have sometimes exposed the city to hostile attacks, yet it has much more frequently, from the same cause, been the object of courteous attention on the part of foreign powers, even when, as at present, the military character of its inhabitants may have sunk below mediocrity. Byzantium, says Polybius, writing about one hundred and fifty years* before Christ, occupies a position as remarkable for its excellence in regard to the sea, as for its badness in respect to the land; and without her will no merchant can sail either to or from the Euxine. The Byzantines are therefore masters of that branch of commerce; and it is through them that the articles, for the supply of which the Euxine is celebrated, are brought into the markets of the Mediterranean; and these he states to be *cattle*† and slaves of the best description, honey, wax, and salt fish. The trade in corn does not appear to have been then, as now, one exclusively of export from the Black Sea; but alternately of import and export, according, no doubt, to the seasons, and the state of demand under the various latitudes. In a fragment of Polybius, quoted by Athenæus (lib. vi. cap. 21.), we find mention again made of the export of salt fish from the Euxine. It was one of the foreign luxuries introduced at Rome which drew down the indignation of Cato the censor, who complained that the Roman citizens would purchase a jar or small barrel of the salted or pickled fish of the Euxine, perhaps our caviare among the rest, at the price of three hundred drachms (something under 10*l.*), and comely youths for slaves at a cost greater than that of an estate.

* His birth could not be earlier than B.C. 210, and his death could not be before the year 129 B.C. He died of a fall from his horse at eighty-two, and appears to have written within the last twenty years of his time.—See *Clinton's Fasti Hellenici*, vol. ii., p. 119.

† *Σειμαῖα* and not *διμαῖα* is asserted to be the true reading in this passage (lib. iv. cap. 38); and if so, *hides* are not to be reckoned (as they have been by Falconer and others) among the ancient exports, although they are among the modern. Honey and wax are still produced in abundance, and form articles of export as well from the neighbourhood of Trebizond, where Xenophon describes the dangerous effect produced by the honey upon his soldiers, as from Taganrog within the sea of Azof.—See *Travels by Thomas Mc Gull*, 12mo. vol. i. pp. 210, 212.

Many anecdotes, indeed, that rival the wit and *goût* even of the celebrated *Almanach des Gourmands*, may be found in Athenæus, with regard to the salt fish, and the tunny of the Euxine; where Archestratus, who made a gastronomic tour of the world*, is made to tell his brother epicures, in the Homeric vein, that, dressed after a particular fashion, they are—

ἀθανάτοισι θεοῖσι φῶν τε καὶ εἶδος ἰμοῖται

And, to be serious, the constant recurrence of the figure of a fish on the coins of the Greek cities on this sea†, as well as of a fish-hook on those of Byzantium, is sufficient to show us what a value was set upon this source of wealth.

Under these circumstances, Polybius continues, the Byzantines are looked upon as public benefactors; and not only do they experience the gratitude of Greece, but should danger threaten them from the barbarians, they would with just reason be publicly benefited by her aid. It is singular to observe how something, at the present hour, of the same political feeling towards the possessors of Constantinople, has operated to the preservation of the Turkish empire, so foreign to all the nations of Europe both in religion and in habits. Were it not for their holding the key of the Euxine, and the difficulties that for ever occur in the way of its passing into other hands, they would doubtless have been before now swept from the list of European powers; and, in point of fact, it was the interest that the leading states of Europe could not but take in the affairs of Turkey, that brought our frigate into the harbour of Constantinople, and thence into a sea at other times so constantly sealed against the admission of ships of war.

It was on the 9th of November, 1829, that the Blonde frigate, under the command of Captain Lyons, sailed from Constantinople for the Black Sea, with the permission of the Turkish government. She appears immediately to have experienced the weather so frequently described by the ancient writers to the discredit of this sea, and which, probably, as well as the reported cannibalism of its northern Scythian hordes, procured for it the name of ἄξενος, or inhospitable. Ovid boldly enough remarks—

‘Frigida me cohibent Euxini littora Ponti
Dictus ab antiquis Axenus ille fuit.’

Having had a fair wind, says the master, on the 9th, on the 10th we were taken aback with fresh winds from the northward, accompanied with rain and thick weather. It was doubtless by such a rebuff as this, that the Argo in ancient days, or the wretched craft

* δ' ἄριστος τῶν ἀνθρώπων τὸν οἰκουμένην ὅλης γαστρὸς ἐνέκα, &c.—*Athen.*, lib. iii. p. 116, f.

† Many such engravings of coins may be seen in Guthrie's *Taurida*.

of the modern Turks, would have been thrown upon those terrors of antiquity the Cyanean * rocks, or Symplegades, in spite of all the aid they might invoke from Jupiter *Urius*, the god of fair winds, whose temple stood upon the Asiatic Cape. But although these rocks could present no danger to a British vessel of any description, there are still some other points in connexion with the ancient opinions respecting this sea which it will be worth our while to examine at its very entrance.

It is remarkable that Polybius, an historian and geographer of no small experience and ability, and one who prided himself upon taking his facts from actual observation rather than from report, hazards the prediction that the Euxine was destined to be choked up, and to become unfit for navigation, if not absolutely dry land; and that too not at a remote or indefinite period, but speedily (*ταχέως*) after the time at which he wrote. The manner in which he arrives at this conclusion is sufficiently curious. Whenever, he says, an infinite cause operates upon a finite object, however small may be the action of the cause, it must at last prevail. Now, the basin of the Black Sea is finite, while the time during which the rivers flow into it, either directly or through the Sea of Azof, bringing with them their alluvial deposit, is infinite; and should it only, therefore, be a little that they bring, the result described must ultimately come to pass. But when we consider how great the accumulation is from the numerous streams that empty themselves into this basin—that is, how powerful and active is the operation of the cause—then it is manifest that not only at some indefinite time, but *speedily*, what has been said will come to pass. He then strengthens his position so assumed, by stating that according to all tradition, the Palus Mæotis, having been formerly a salt sea, conjoined, as it were, in the same basin (*σύνῃ*) with the Euxine, had then become a fresh-water lake, of no greater depth of water than from five to seven fathoms, and no longer, therefore, navigable for large ships without the assistance of a pilot; and he further instances, as an evidence of the progress of his cause, the great bank (*τρινία*) which appears in his time to have existed off the mouths of the Danube, of which we shall afterwards have occasion to speak.

Now, without going back to the question of the flood of Deucalion, or the supposed bursting of the waters through the canal of Constantinople, and the consequent lowering of all above it, we may remark, that with regard to the Palus Mæotis, or Sea

* Olivier, who was on this spot at the close of the eighteenth century, observing on the volcanic appearances in the neighbourhood, says that he found a considerable quantity of a bluish trap, coloured by copper. 'C'est cette dernière sans doute qui a fait donner par les anciens le nom d'isles Cyanées,' &c.—*Voyage dans l'Empire Ottoman*, &c. tome i. p. 122.

of Azof, it certainly appears, from the statement of Captain Jones of the Royal Navy, who was at Taganrog in 1823, that in the neighbourhood of that place—that is, near the mouth of the Don—the water is exceedingly shallow, varying from ten to three feet, according to the direction of the wind; and that although in south-west winds, when the water is highest, it becomes brackish, yet at other times, it is drinkable, though of a sweet, and by no means refreshing, flavour.* But upon casting our eyes upon our modern charts, especially upon that complete and excellent one constructed at Paris in 1822, and corrected by observations made in 1820 by M. Gaultier, captain in the French naval service, M. Benoist, of the hydrographical department, and others (for the use of which, as well as of the remarks of Mr. James Turton, the master of the *Blonde*, I am indebted to the liberal kindness of the Admiralty), we are immediately struck with the fact, that all over the rest of the Sea of Azof, the soundings vary from forty French feet in the centre, to an average, perhaps, of seventeen or eighteen close in with the shore; so that in the space of nearly two thousand years, no approximation whatever has been made to that entire choking even of the Palus Mæotis which Polybius so confidently and so speedily anticipated, while Captain Jones expressly assures us, that, upon strict enquiry, he ascertained there was not the slightest foundation for the favourite theory of the diminution of the waters of the sea of Azof.†

In the Cimmerian Bosphorus indeed, the strait leading from the sea of Azof into the Black Sea, the water is shallow, as it was in the days of Polybius, and as it may always be expected to remain, from the crookedness and extreme intricacy of the passage, which prevents the fair rush of the stream from the northward, and thereby favours the accumulation of deposit. The soundings, in the shallowest part of this, are as low as thirteen French feet; but as soon as we get into the part of the passage which opens into the Euxine, we find the soundings deepening from four fathoms French gradually to twenty or more, when we reach the open water; and although on the eastern side of the channel, the soundings are on mud, yet they change in the course of five miles to sand and mud, and afterwards rapidly to shells; while down the middle of the passage they are continually upon shells, or sand and shells,—in either case affording a pretty convincing proof that no accumulation is going on in the passage, but that even there, with all its disadvantages, the rush of water from the less sea to the greater is sufficient to keep its own channel clear, and to obviate the inconvenience Polybius apprehended.

But if we look to the southern portion of the Euxine, and the entrance into the Thracian Bosphorus or canal of Constantinople,

* Jones's *Travels*, vol. ii. p. 143.

† *Ibid.* vol. ii. p. 145.

we there find a depth of forty-eight fathoms French immediately off its opening, and an equal or greater depth all around, with a bottom of *sand* and *shells*, except on the coast trending towards the north-west and the mouths of the Danube, where the bottom is indeed mud, but the soundings are from forty-five to fifty-five fathoms; while at a distance of about thirty-six miles from the opening, the soundings are marked at one hundred and sixty fathoms, and *no bottom*, upon the French chart; and in the track of the Blonde it appears she sounded in thirty-five fathoms in the mouth of the channel, in fifty fathoms at eighteen miles north-east of the opening, and afterwards six times in her run to Sebastopol with one hundred, one hundred and twenty, and one hundred and forty fathoms of line, and found no bottom,—the last of these soundings being only sixteen miles from the lighthouse on the point of land before making the harbour.

It must fully appear, therefore, that however plausible may be the theory of Polybius, his melancholy anticipation is in no assignable degree likely to be realized in any imaginable time; but that the depth of the Euxine itself, and the constant and vigorous rush of water through the comparatively straight, narrow, and deep passage of Constantinople, even though the surface water may there sometimes be found, in strong southerly winds, to set a little to the northward (as was actually experienced by our enterprising countryman Dr. Clarke, as well as observed by the master of the Blonde), will always be sufficient to contain, or rather to carry off, any deposit however large, which the Danube, the vent of so large a portion of Europe, or the Phasis, the Ilalys, and other Asiatic streams, or the mighty rivers of the north, can bring down from the countries through which they flow.

The notion, indeed, so confidently stated by Polybius, was not in his own time altogether new. We find recorded in Strabo* the opinion of Strato of Lampsacus to the same effect, who died two hundred and seventy years before Christ, and therefore wrote about one hundred years before Polybius. He says indeed more: that the Euxine is very shallow†; that it was then filling up with mud from the deposit of the rivers; that its water was perfectly fresh‡; that it would shortly be choked up; and that its western side was already nearly in that state. M. Gosselin seems to be of opinion that Polybius derived his facts and inferences altogether from this passage of Strato; but although we cannot pretend to say that he was wholly ignorant of it, since it remained to the days of Strabo§, who wrote long after Polybius, and are of neces-

* Lib. i. pp. 49, 50.

† βραχυτάτα μὲν εἶναι τὰ περὶ τὸν Πόντον. . . . ἴλυνος πληροῦσθαι.

‡ γλυκυτάτην εἶναι τὴν Ποντικὴν θαλάτταν.

§ See Mr. Fynes Clinton's elaborate and accurate examination of the date of

sity struck by the resemblance, yet with a writer of so high a character as Polybius, we must necessarily demur to an opinion which goes so far to impugn his general authority, since we find that he makes no mention at all of Strato's name; that he altogether disclaims having taken up his ideas from the tales of voyagers*, and asserts that he has derived them from a careful investigation of natural causes only†.

It is not a little surprising to observe that Dr. Clarke has given this surmise apparently as his own, deducing his inference chiefly from the shallows prevailing about Taganrog, and the mouth of the Don. 'From all this,' he says, 'it may not be unreasonable to conclude, that both the Black Sea and the Sea of Azof, by the diminution their waters hourly sustain, will at some future period become a series of marsh lands, intersected only by the course and junction of the rivers flowing into them.' Now as he professes to have diligently examined, and greatly extols the accuracy of Strabo, particularly in his description of the coasts of the Crimea, it is hardly to be supposed that the passage in question should have escaped his observation, even if he should not have been aware of that of Polybius; and we can only imagine that, finding in his notes a memorandum to this effect, which had been originally inserted in order to recall the passage of Strabo to his recollection, he had forgotten, at the moment of writing, from whence he had derived the hint, and accordingly worked it up inadvertently as a suggestion of his own. His own voyage, at least, from Odessa to Constantinople, and the terrific sea he encountered in the deep waters of the Euxine, might have sufficed to show him that this ancient prophecy was as far as ever from its accomplishment.

To return, however, to our British frigate: on the 13th of November she arrived at Sebastopol, and remained there for the best part of four days; but, partly owing to the quarantine; partly to the jealousy of the Russian authorities, who would barely allow Captain Lyons to pull up the inner harbour in his boat attended by one of the boats of the Russian admiral; and partly from the state of the weather (for it snowed hard during nearly the whole of her stay), little or nothing could be accomplished either in the way of observation or discovery. That, however, is perhaps the less to be regretted, because Sebastopol and the adjacent country was a scene on which Dr. Clarke had bestowed his most particular attention, aided by the talents and experience of Professor Pallas; and because Captain Jones has given us a very copious and exact account of everything belonging to its modern appearance and

Strabo's birth, &c. which he places at from sixty to fifty-four years before Christ, in the second volume of his *Fasts Hellenici*, pp. 552. 3, and 4.

* Ἐκ μεταξὺν διηγήματα.

† ἐκ τῆς κατὰ φύσιν θεωρίας, ἧς ἀκριβοστεῖον εἶναι ἐν πᾶσι.

condition; and while we touch, therefore, upon some few points mentioned by them, we cannot but refer the reader to the more extended discussion and greater store of information contained in their respective works.

The harbour is described by the master of the *Blonde* as being one of the finest in the world; so far guarded by nature from attack, that there is a reef of rocks on either side of the entrance, with a sunken rock nearly mid-channel, on which is a floating beacon with a flag, as well as on the outer edge of the reef on the southern side of the entrance. Dr. Clarke's chart gives no indication of the sunken rock, which may not, probably, at the period of his visit, have been so clearly pointed out by the beacon. By the aid of these beacons the frigate had no difficulty in making her way into the outer harbour, being further assisted in the operation by two lighthouses on the eastern shore, which, brought into one, are the sailing mark for the proper channel. But not being permitted to penetrate any farther, she dropped her anchor in nine fathoms water, with a muddy bottom.

With regard to artificial defences, there are many considerable forts which guard the several points of approach, some of which are in decay, while others have been lately repaired and strengthened by the labour of the Turkish prisoners in the late war. Sebastopol itself is exclusively dedicated to the service of the Russian navy, and no other vessels are permitted to enter it except under circumstances of distress: a restriction which existed at the period when the late lamented Bishop Heber visited this port: and he was informed that it had been occasioned by the peculation of the government officers, who had sold the stores of which they had the custody to the merchants who visited the harbour; a statement which is also confirmed by the authority of Captain Jones*.

The outward harbour, in which the *Blonde* was moored, is directly exposed to the north-west and west winds, although the heaviness of the sea may in some degree be broken by the reefs at its entrance. Opening from it on the southern side are several bays, and among them the Quarantine Harbour, a wretched establishment, but sheltered from every wind; and farther on to the eastward, the inner harbour, which is also completely sheltered, sloping to the south-west, with eight fathoms water at its entrance, and seven and six fathoms off the arsenal and town upon its western shore. It is four or five miles long, and navigable for first-rate men-of-war for more than half that distance; but it has no docks, and the ships appeared to be suffering materially for want of repair. This may probably be owing to the depredations of the worm

* Vol. ii. p. 252.

called the *Teredo navalis*, or *Calamitas navium*, which Madame Guthrie, who visited Sebastopol in 1795, tells us seemed here to have taken up its favourite abode*. It was up this harbour that Dr. Clarke proceeded in search of antiquities, and he makes the whole of the roads and harbour together to be the *Ctenus* of Strabo, which, from the northern side, meeting the harbour of Balaclava, the ancient *Symbolorum Portus* on the southern†, made what was called the smaller or *Heracleotic Chersonese*, as part of the greater *Chersonesus Taurica* or *Crimea*. It contained within it the cities of *Chersonesus* old and new, of which Dr. Clarke observed that some ruins still remained. They were much more considerable when the Russians first obtained possession of the *Crimea*; the gates even of the town being then in existence; but were speedily destroyed by the use of these ancient materials in the modern buildings. It contained, too, the celebrated Temple of *Diana* on one of two or three promontories in that part of the world, which were all called *Parthenium*, after that goddess; the remains of which name are still to be found in *Parthenit*, on the south-east side of the *Crimea*: all no doubt commemorative of the story of *Iphigenia*, and of the former barbarity of the inhabitants, before a greater degree of civilization and refinement was introduced by the Greeks, as denoted by the inhuman sacrifices attributed to the worship of the goddess. The *Chersonese* was called *Heracleotic*, as well as its town, from having been colonized and built by the people of *Heraclea*, on the southern shore of the *Euxine*. Under the Turks it obtained the name of *Aktiar*, it is said, from its white rocks; and the name of *Sebastopol*, though it sounds of ancient derivation, was not given to it till the reign of the Empress Catherine: a name, we should be disposed to say, singularly ill chosen, because it tends to root out the ancient appellation of the town and district of *Chersonesus*, and may cause some confusion in geography between this place and the real *Sebastopolis* of *Arrian* and others, which, like *Cæsarea* or *Augusta*, was evidently so called from *σεβαστος*, signifying *Augustus*, and therefore an ordinary appellation of the Roman emperors. This real *Sebastopol* was on the Asiatic coast, about two-thirds of a degree north of the river *Phasis*, and was still more anciently called *Dioscourias*, from *Castor* and *Pollux* the *Dioscuri*; the memory of which most ancient name is still preserved in the present appellation of *Iskouriah*. There was a time, indeed, when this ancient *Sebastopol*, or *Dioscourias*, was accounted to be part of *Europe* rather

* Guthrie's *Taurida*, p. 91.

† The appellation of *Sinus Portuosus*, found in *Pomponius Mela*, lib. ii. cap. i. § 3, would in sense appear to accord well with the harbour of *Sebastopol*, and has therefore sometimes been identified with it; but the position he assigns to it between *Cape Ata* and the next point to the westward can only accord with *Balaclava*, which is truly *καλὰς λιμῆς, et promontoriis duobus includitur*.

than of Asia: for although the Tanais has been long, by common consent, deemed to be the boundary of these two quarters of the globe, we learn from Arrian, as we indeed had before heard from Herodotus*, who clearly adopts the opinion, that the Phasis was once considered in that light; and this ancient point of geography has been the means of preserving to us a fragment of a lost play of Æschylus†, the Prometheus Released (the sequel of the drama that has come down to us, the Prometheus Bound), which Arrian quotes in order to prove his assertion. The Titans are made to say to Prometheus, 'We are come,

τοὺς σοὺς ἄδελφους τέουδες, Προμηθεῖ,
δισμῷ τε πάθος τοῦ ἐποφύμενοι,

and then, in relating what countries they have traversed in their course, they specify

τῆς μὲν διδύμου χθονὸς, Εὐρώτης
μεγάλης τ' Ἀσίας τίεμονα φᾶσιν‡.

This true Sebastopol, or Dioscurias, was also a place of the greatest consequence to the commerce of the ancient world, inasmuch as it was the great port from which the produce of the countries in the neighbourhood of Caucasus, and of India itself, was shipped for Europe: and so great was the concourse of merchants there assembled, and so various their tongues, that we are told by Pliny§ the Romans maintained in that city no less than one hundred and thirty interpreters, to facilitate the progress of their traffic with the people of three hundred nations. We cannot, perhaps, better illustrate the facility of mistake between the two Sebastopols, than by saying that Captain Jones has inadvertently applied this statement to the Sebastopol of the Crimea||.

But although Arrian gives us much information upon the locality of places on the south and eastern side of the Euxine, it is

* Melpomene, c. 45.

† As Æschylus and Herodotus were so near each other in point of time, we may infer that this opinion was the common one of their day. It is rather a curious point of chronology, with respect to some of the principal authors who have come down to us, that at the battle of Salamis, B.C. 480, Æschylus was forty-five years old, fought in it as he did at Marathon, and describes it in his Persæ; Pindar was thirty-eight; Sophocles was twenty-five; Herodotus was four; and Euripides was born on the very day.

‡ I have adopted this emendation of the words of Arrian, which cannot be reconciled with the metre,

τῇ μὲν διδύμῳ χθονὶς Εὐρώτης
μὲν γὰρ τῇ δ' Ἀσίας τίεμονα φᾶσιν,

from Bp. Blomfield's preface to the Persæ of Æschylus, p. xv., where he points out another geographical fragment of the same play in Strabo.

§ Urbe Colchorum Dioscuriade, juxta fluvium Anthemunta, nunc deserta: quondam adeo clara, ut Timosthenes in eam ex nationes, quæ dissimilibus linguis uterentur, descendere prodiderit: et postea a nostris cxxx interpretibus negotia ibi gesta.—Plin. lib. vi. cap. 5.

|| Vol. ii. p. 252.

remarkable that he says comparatively little of the country about the modern Sebastopol. From the canal of Constantinople, all the way to Dioscourias, he is copious and exact in giving the names and distances of all the towns, headlands, and rivers on the Asiatic coast; but in going round the northern shores, his intervals become greater, and his measurements less attended to; so much so, as to give great colour to the supposition that this part of his *Periplus* was not undertaken by himself in person, but that his information, addressed to the Emperor Hadrian, was gathered from such reports as he could obtain from those who asserted their acquaintance with the coast. After leaving Pantacapaum, near the mouth of the Cimmerian Bosphorus, he gives us the names in succession of Cazeca (Καζέκκ,) and of Theodosia, an ancient Greek city of the Ionian race, a colony from Miletus, the fruitful parent of more than eighty cities of great celebrity in the ancient world, but even in Arrian's time, about one hundred and thirty years, that is, after our Saviour, ruined and deserted.

It is generally considered that the modern Caffa stands on or near the site of the ancient Theodosia, which was the boundary between the possessions of the kings of Bosphorus and those of Chersonesus, and a place of vast importance to ancient commerce, as well as to the Genoese, in their occupation of these shores, by whom it was called Krim-Stamboul, or the Constantinople of the Crimea. But Bishop Heber remarks, that after many days search, he could find no vestige on which he could rely as having belonged to the ancient Theodosia; and Dr. Clarke, with greater temerity, expresses himself convinced that it is not at Caffa, but at Stara Crim, the ancient Cimmerium, an inland town, from which the names Krim and Crimea are evidently derived, that we are to look for Theodosia. Be that as it may, the ancient name is still preserved upon the charts, by the appellation of Theodosia given to the Cape immediately to the southward of the town. Arrian then mentions the port of the Scytho-Tauri, which Bishop Heber supposes to be Sudak, where he visited Professor Pallas in his retirement from the *malaria* of Akmetchet; and Halmitis Taurica, which appears to be confounded with Lampas, whose name is still preserved in Lampat, and the port of Symbolum, which we have before said to be Balaclava, a name which Dr. Clarke derives from the Genoese *Bella Clava*, or fair haven, which would then be the translation of καλὸς λιμὴν. But if he is right in calling the same place the Παλακίον of Strabo, it may more probably be the case that Balac, the first half of the word, is the same with the beginning of that Greek word, and that Balaclava means the harbour of Παλακίον. I am informed, indeed, by a Russian authority, that Balaclava has nothing to do with Genoese, but is an ancient Tartar name, and that other places, and those

upon the Caspian, are called by it as well as this : but still Παλακίον may be a Greek version of the ancient name, which the Tartars may have adopted when they became possessed of the country*.

In crossing from this place to the harbour of Sebastopol, Dr. Clarke saw the vestiges of the ancient wall which defended the isthmus of this smaller Chersonesus, and found the distance to be five miles, nearly the same which is assigned by Strabo, who supplies the deficiencies of Arrian upon this coast. For as far as Arrian's account alone is concerned, it is difficult, or rather impossible to identify the places he thus mentions between Theodosia and Chersonesus ; and the more so, because he has omitted some of the most striking natural features of the coast. For instance, he does not even vouchsafe a name to the great southern headland of the Crimea, the Criû-Metopon (κριῦ μετώπον) or Ram Head, so much spoken of by Strabo and others, which, looking across the Euxine to the promontory of Carambis, on the coast of Asia Minor, still called Kerempéh, divides it, as it were, into two parts, by a line which the imagination readily supplies between the thirty-first and thirty-second degrees of longitude ; and which, in the estimation of the ancients, gave to the whole sea the shape of the Scythian bow : two points of land, indeed, so remarkable, that many navigators of Strabo's time, as he reports, affirmed that they had, in sailing between them, seen both lands to the northward and southward at once,—an affirmation which Dr. Clarke repeats, without any reference to Strabo, as a matter of fact, although he had himself been in no situation to verify it.

The distance from the one Cape to the other, measured by the compasses on the French chart, is one hundred and forty-four geographical miles, which Strabo calls two thousand five hundred stadia ; and even supposing a ship therefore to be placed exactly midway, the distance from either promontory must be seventy-two geographical miles ; so that for the land to be seen from the deck of a frigate at that distance, it must be three thousand five hundred feet high, according to strict computation, while some hundreds of feet more must be added to make it really and in practice visible. Major Rennell† states the distance to be one hundred and thirteen geographical miles ; and adds, that ‘ the high land of the Crimea is visible from Carambis,’ but does not give his authority for that fact. Of the height of Cape Carambis I can find no statement ; and Tournefort, who so diligently traced the whole coast from Constantinople to Trebisonde, gives no estimate of it, although he mentions having doubled it, and calls it Cape Persillo. With respect to the Criû-Metopon, Dr. Clarke, who had been upon it,

* Lady Craven, in her Tour, p. 146, says, that it was before called *Cembats*, but cites no authority. Can this name have any connexion with *Symbolon* Portus ?

† Geography of Herodotus, vol. i. p. 264, 8vo.

gives no estimate of its height; but the master of the *Blonde* remarks, that 'coming from the south-west the land is very remarkable, forming three capes or headlands; the southernmost (Cape Aia), very high, bluff, bold-looking land, much like the North Foreland, but much higher;' and in a sketch of the coast line it is estimated at about one thousand two hundred feet—the same elevation which is assigned to it by Professor Pallas. 'The next to the northward,' the master continues, 'Cape Fiolente,* is moderately high, with three notches like steps in it, and between these two the harbour of Balaclava. The northernmost' (preserving the ancient name of Cape Kherson) 'is long and low, with a good lighthouse on it, well lighted.'

Whether, therefore, these two capes, or any land higher than themselves, which may be in the rear of Camambis especially, can actually be seen at once, we have no certain authority to determine; and we will therefore close this portion of our subject merely by remarking that the *Ram's Head* supplied the ancients with the same name of *Criû-Metopon* for the western promontory of Crete; and that in the comparison of Cape Aia with our North Foreland, we have perhaps in the name of the town of *Ramsgate* the traces of the same fancied resemblance.

On the 16th of November, the *Blonde* quitted the harbour of Sebastopol, and stood to the northward along the coast, on which neither tree nor bush was to be seen, till she was off the point of Koslof, which Bishop Heber visited, and calls the ancient *Eupatoria*, but could remember nothing interesting that he had found there.

From Koslof the land was found to be even, and moderately high to the northward, till it terminated in the low point called Cape Tarkhan, which is the westernmost point of the Crimea; from which begins the *Cercinetis Sinus*, still called the Gulph of Kerkinit, mentioned by both Arrian and Strabo, and leading up to the isthmus which joins the Crimea to the main-land. On this point is an excellent light, which was seen at the distance of eleven or twelve miles.

From hence the frigate stood across for the western shore, which she made near Ackermann, and then went up to Odessa; but she found the distance across to be eleven or twelve miles less than that commonly given to it upon the charts; and in sounding at twenty miles from the coast, she found twenty-two fathoms water, with a bottom of small stones and broken shells. Not even here, therefore, so close off the great estuary formed by the mouths of the Dnieper, the Bug, the Dniester, &c., finding any realization of the dreaded accumulation of alluvial deposit.

On the 17th of November, she anchored in seven fathoms water,

* Called *Féling* by Le Chevalier, vol. ii. p. 345.

in a bay or roads so open as to render any sailing marks unnecessary, over the whole of which the same depth of water generally prevails. During the two days of her stay the weather was thick, and the ship again under quarantine, so that observation and communication with the shore were again impracticable. The town, however, appeared from the sea to be handsomely built, and the lazaretto and other quarantine establishment far superior to that of Sebastopol.* There were no fortifications, or guns mounted, and the salute fired by the *Blonde* was returned by a Russian brig, the only vessel of war then at Odessa.

Arrian makes mention of a town called Odessus, somewhere in this neighbourhood, where was a harbour, and makes its distance to be one hundred and forty stadia from Olbia, near the mouth of the Borysthenes. To determine the exact site of Olbia† is not altogether so easy a task; but whether we take it to be very nearly where the modern town of Cherson was established in 1774, at the confluence of the Inguletz with the Dnieper, under an ancient name again falsely applied, and which is very commonly supposed to have been built out of the ruins of the ancient Olbia; or even go the length, which some others have gone, of placing it at Otchakoff, where the lake into which both the Dnieper and Bug empty themselves flows into the open sea, the distance from either place to the modern Odessa so greatly exceeds the distance

* There is a very good account of Odessa, in August, 1804, by J. H. Sievrac, appended to McGill's Travels, vol. ii. p. 192, &c. The lazaretto was then building.

† The chief data for the site of Olbia appear to be in Herodotus, Dio Chrysostom, and Strabo. From the former, (lib. iv. cap. 17, 18, and 53) it appears, that between the Hypanis and the Borysthenes there was a point or tongue of land, ἑμβολὸν τῆς χώρας, and that upon this, near to the Hypanis, lived the Olbiopolitæ, also called Borysthenitæ; the city of Olbia and Borysthenis being one and the same place. From Dio Chrysostom's Thirty-sixth Oration it also appears, that the city of Olbia was on the Hypanis, although it derived its name from the Borysthenes; ἡ γὰρ πόλις τὸ μὲν ὄνομα εἰληφεν ἀπὸ τοῦ Βορυσθέινους διὰ τὸ κάλλος καὶ τὸ μίγξις τοῦ ποταμοῦ· κείται δὲ πρὸς τῷ Ἰστανίδι. He also describes the tongue of land under the same name with Herodotus, as being ἰζὺ καὶ στερεόν, ὥσπερ ἑμβολὸν, περὶ δὲ συμπίπτουσιν οἱ ποταμοί. Strabo, in describing it, says, πλείυσαντι δὲ τὸν Βορυσθίνην σταδίους διακόσιους, ἑμύνημος τῷ ποταμῷ πόλις· τί δ' αὐτὴ καὶ Ὀλβία καλεῖται. And in another place where he has mentioned the Borysthenes (next in order after the Tyras or Dniester, if our present text is perfect,) he adds, καὶ πλεονεξίαν ἄλλος ποταμός Ἰστανίς, speaking of it as close and secondary to the Borysthenes. Now it is usual to call the Hypanis the Bug; and hence arises the difficulty of fixing the site of Olbia, because at the distance of the Bug from the Dnieper it is quite impossible that they can be said to form ἑμβολὸν τῆς χώρας, or that a city on the banks of the one could in any sense or degree be said to be on the other. But if we call the Inguletz the Hypanis, as has been done by Madame Guthrie after Peyssonnel, we have then the ἑμβολὸν formed by the junction of that river with the Dnieper, as described by Herodotus and Dio Chrysostom; and the city of Olbia placed upon it might be said to be on either river, though closer to the one than the other; and it would nearly occupy the position of Cherson, though not on precisely the same spot. We may add, that Hypanis is not an unfrequent name of a river, the Cuban having been so called, or rather now bearing the same name. And if the Bug was called Hypanis, the Inguletz may have been called so too, an idea which is perhaps strengthened by Strabo's expression of ἄλλος ποταμὸς Ἰστανίς. This site of Olbia agrees also with its distance from the sea according to Strabo.

assigned by Arrian, as to render it impossible that that town and this ancient Odessus can have anything in common. We have here, therefore, an additional instance of the misapplication of ancient geography under the Empress Catherine; which might lead also to confounding this ancient Odessus, mentioned by Arrian alone, with the Odessus mentioned by both Arrian and Strabo, which is far to the south of the Danube, and in fact the modern Varna.

On the afternoon of the 18th of November, the Blonde again left Odessa, and steered for the Isle of Serpents; still sounding at from ten to fifteen fathoms and more, with a bottom of stones and shells; which agrees generally with the depth and bottom marked upon the French chart. As no other island but the Isle of Serpents is now found to exist in this part of the Euxine, at any distance at least from the shore, and it is difficult, in the first instance, to suppose that one which existed in the time of Strabo and Arrian has now disappeared, it is commonly said that this is the same with the Island Leuce, or Isle of Achilles; the former of which names it obtained, as Arrian says, from its white colour, and, according to Dionysius, from the quantity of white birds by which it was frequented.

λευκὴν μιν ἱππωνυμίην καλέουσιν
οὐνκα οἱ πάπερ ἴσσι κινώπεται, λευκά τέτυκται.

These birds, the Scholiast upon Pindar, who mentions this island as belonging to Achilles,—

ἐν δ' Εὐξίνῃ πελάγῃ
φαεννὰν Ἀχιλλεύς
ἔβρον (sc. ἔχου).—Nem. iv. 79.

when he is interpreting the epithet φαεννά to be equivalent to λευκή, says were ἐρωδιοί, which we commonly translate storks, from whence we have our common genus of plants, the erodium or stork's-bill; but Dr. Clarke, who refers to this passage, expressly translates the word ἐρωδιοί into *pelicans*—not giving, however, any authority for this opinion in ornithology. It is certain that great numbers of pelicans frequent this sea, and perhaps the mouths of the Danube, in company with both storks and cranes; but although Bishop Heber saw an immense quantity of pelicans on the Asiatic side of the Sea of Azof, upon coming into the Crimea, he remarks, 'I saw no more pelicans after landing in Europe,' though he saw plenty of bustards, cranes, and storks.

It may be reasonable to suppose, from putting these authorities together, that the surface of the island, as I know from my own observation to be the case in the Fairn Islands, and other parts of our own coast, was, in and after the breeding season especially, the time when it was commonly seen by the ancient navigators, covered with the white dung of the countless flocks of sea-birds

that resorted to it. Arrian, indeed, assigns to these birds, which he says were of various species*, and innumerable, a very different office in connexion with the name the island bore. It was a present, he says, from Thetis to her son Achilles. He had himself lived upon it, and there was here a temple erected to his honour, with a statue of ancient workmanship, where the goats, the natives of the island, were sacrificed to this demigod, and many costly offerings adorned his shrine, with inscriptions, Greek and Latin, in various metres, addressed both to Achilles and Patroclus. The birds, he adds, are the guardians of the temple; they fly forth in the morning to the sea, where, having bedewed their plumage with its waters, they hasten back to sprinkle and to cleanse the sacred pavement with their wings!

The classical scholar is here, perhaps, reminded of the beautiful scene described in the opening of the *Ion* of Euripides, although, as respects the birds, it presents the reverse of the picture which Arrian describes. There we find the young *Ion*, the nursling of the Temple of Apollo, at Delphi, employed at early dawn in sprinkling the water of Castalia, and in brushing away all impurities from the shrine with the branches of the hallowed laurel. The birds come flocking to the sacred scene from their abodes upon Parnassus; but, all poetical as may be their dwelling-place, and well-tutored as such birds of Apollo may be supposed to have been, still, it is the care of the youthful guardian of this temple to chase them from its courts and altars, under the rational apprehension that they would rather defile than purify the offerings and the holy places.

To return, however, to our subject. Arrian goes on to relate several other tales which were current in his days of the wonders of this island, in which he takes care to express his own belief, and, among others, one which shows that the ancient sailors had something of the same superstitions as those which still prevail among our seamen. Some, he says, have affirmed, that when they were off this coast, they have seen Achilles perched upon the mast-head or yard-arm, in the same way that Castor and Pollux are seen by navigators in every sea, and are hailed as the symbols of their safety. It does not, however, seem that Arrian knew much of this island of his own knowledge; for it is pretty clear that he confounds it, in some respects, with a tongue of land in the neighbourhood of the Borysthenes, and to the eastward of that river called Ἀχιλλέως ὄρεος, the Course of Achilles, which Strabo, and I believe all other geographers of note, held to be altogether different from the island of Achilles, and which Pliny describes to be in the form of a sword-blade stretched across the sea. Dr.

* λάροι καὶ αἰθύναι καὶ κορώναι αἱ θαλασσιναί; making no mention of *ἰεῦδιαι*.

Clarke preserves a portion of an inscription found in the supposed ruins of Olbiopolis, and brought from thence by Mr. Kelsall, of Trinity College, Cambridge, which begins with the very singular title of Ἀχιλλεῖ Πονταρχῆ, to Achilles the Lord of the Sea, a title which may serve to throw some light upon the legend of his being the son of a sea-nymph: and a tongue of land near the mouth of the Borysthenes is still called Kilburun; which, as Burun signifies projecting land, (as in Aia Burun, Cape Aia, and many other places,) is clearly Achill-Burun, or Achilles Point, probably the identical δρόμος Αχιλλέως of antiquity. It is curious, indeed, to observe how the name of Achilles is connected with this sea; and we may venture to add to the invaluable work of Major Rennell on the Geography of Herodotus, the reason of the appellation bestowed upon the remarkable tract in question, which he says is not told*. For we call to mind that Iphigenia, to whom Achilles was affianced, or who was rather brought to Aulis under that pretext, according to Euripides, when she was rescued from the impious sacrifice, is represented to have been transported to the temple of the Taurian Diana; and we may imagine these names to have been the vestiges of the subsequent pursuit of her disappointed lover. The Scholiast, indeed, upon Pindar, in the passage to which I have before referred, distinctly gives us this tradition†; and the classical student, who has leisure to toil through the obscurities of Lycophron, will find that this pursuit on the part of Achilles is expressly mentioned by that author; that he names the Island and the Dromos as two different places‡, and says, that the hero was fated to tread the soil of Scythia, through five years of grief, in quest of his betrothed—

χ' ὃ μὲν πατήσῃ χῶρον αἰάδων Σκύθην
εἰς πάντα που πλειύνῃς, ἰμείρων λίχους.—Cassandra, 200.

Dio Chrysostom, too, in his Borysthenitic oration before cited, gives us a curious account of the inhabitants of that place, whom he visited in person, of their extraordinary attachment to the memory of Achilles, and on his account to Homer§, whose poem they all knew by heart, to the exclusion of other literature.

* Vol. i. p. 85, 8vo. ed.

† Ἰσιδιώκειν ἱερῶν δ' Ἀχιλλέως.

‡ In the Iphig. in Taur. v. 420. Euripides appears to confound the νῆσος and δρόμος—

τὰν πολυόνηθον ἐπ' αἶαν,
λευκὰν ἄκταν, Ἀχιλλέ-
ως δρόμους καλλιισταδίους,
Εὐξείνου κατὰ τιντον.

And in the end of the Andromache, v. 1260, Thetis is made to prophesy to Peleus—

τὸν φίλτατόν σι παῖδ', ἰμὸς τ' Ἀχιλλεῖα
ἧΐ μ' ὀνομαζέμεντα νησιωτῆλους,
λευκὴν ἐτ' ἀκτὴν ἐν τ' Εὐξείνου πόντῳ.

ὃ ὥστε οὐδ' ἀπίουν ἔτι οὐκὸς ἄλλου θελασιν ἢ Ὀμήρου. καὶ τὰλλα οὐκ ἐτι σαφῆς

With respect, however, to the identity of the Isle of Serpents with Leuce, or the island of Achilles, when we consider the expressions of various ancient writers, denoting that it was close off the northern mouth of the Danube, though fairly out in the sea; and when we find that the Isle of Serpents is in a direct line, half a degree of longitude (by the chart) from the coast as it at present exists, a coast too that, in all probability, as we shall presently have occasion to mention, has, according to the usual progress of all deltas, gained upon the sea, we cannot help hesitating in giving our assent to those who confidently state them to be the same island; and we endeavour to look for Leuce, if it still exists as an island, nearer to the shore.

Dr. Clarke, who saw the island, estimates it at near one mile in length, and less than half a mile in breadth; but in a very few pages afterwards, he says, that, according to Philostratus, it is 'thirty stadia, or three miles and three-quarters in length,' and that 'this account corresponds with its appearance,' as he saw it; although he had so recently estimated it at about a quarter of that length! He says, too, that 'a part of its history, considered by Scymnus Chius as being the most marvellous, was, that the main land could not thence be discerned, although distant only forty stadia, or five miles.' But even if this statement of what Scymnus Chius says were correct*, how, we may ask, does a distance of five miles, even supposing the coast to have remained unaltered, correspond with half a degree of longitude under the latitude of $45^{\circ} 15'$, which must involve a distance of more than twenty-four miles?

Perhaps we ought not to lay too great stress upon the fact that the aspect of the Isle of Serpents, as represented by those on board the Blonde, is not strictly such as to entitle it to the appellation of white; being a cliff of moderate height, with the land in the centre, of a somewhat conical shape; and green; because, at the time of year when they were there, or if the birds had altogether

ἰλλνίζοντι, διὰ τὸ ἐν μέσσοις οἰκῆν τοῖς βασιβάροισι, ὅμως τὴν γε Ἰλιάδα ὀλίγου (qu. διῷ) πάντες ἴσασιν ἀπὸ στόματος.—Orat. xxxvi.

* The passage of Scymnus Chius is at verse 40 of the Fragments in vol. ii. of the Oxford Edition of the Geographers—

—μετ' αὐτὴν (sc. Πύκνῃ) εἴτα τετράγρια κειμένη
'Αχιλλείως νήσος.

ἔχει δὲ πλῆθος χειρῶν δονίων,
θίαν δ' ἱεροποιῇ τοῖς ἀφικνουμένοις.
οὐ δυνατόν ἐστιν ἀπὸ ταύτης χώρας ἰδεῖν
καί τινος ἀπεχούσης ἀπὸ τῆς ἡττίου σταδία
τετρακισί, ὡς δὴ συγγράφει Δημήτριος.

So that the distance is called four hundred stadia, instead of forty, as Dr. C. quotes it. Of Demetrius, Scymnus Chius elsewhere says—

μετὰ ταῦτα δ' ἰσθ' ὁ Πόντος, οὗ δὴ τὴν θίσιν
'Ο Καλλιστράτος συγγράφει Δημήτριος
ἵσκειν ἰσχυριστάτως πεπυσμένος.—v. 717.

forsaken the spot, the probable cause of its whiteness would have vanished with them; but, bearing in mind what we have said of the dimensions of the island, and its distance from the shore, and examining the coast nearer to the actual mouths of the river, we find the town of Kilia still existing a short way up the stream, and an older Kilia at its mouth, while the northern mouth of the Danube is called, upon the French chart, the 'bouche Kilia;' and as we found the memory of the Dromus Achillis preserved in the modern name of Kilburun, so, without any great stretch of the imagination, we may here trace the ancient name of Achillea, denoting that the real island so called was either one of those now found lying close off that mouth; or that, in the alteration of the line of coast, it may now form part of the main land, and have ceased to exist as an island at all. At all events, it is a desideratum, which has not to my knowledge been accomplished by any person competent to the task, to ascertain, by actual inspection, whether there exist or no upon the Isle of Serpents any remains at all which can be ascribed to the ancient Temple of Achilles.

After passing Serpent's Island, which is of that degree of height as to remain in sight during a run of twelve miles only from it, the Blonde stood in towards the mouths of the Danube and the lighthouse at its principal entrance; having regular soundings still on shells and small stones, till at only three miles and a half from the lighthouse, in ten fathoms water, the strength of the breeze, accompanied by a snow-storm, compelled her to haul off to a greater distance. What then must, we ask, have become of the great bank, the *ταμίς*, which Polybius describes as having been one thousand stadia long, more therefore, at least, than one hundred miles, and at one day's sail from the mouth of the river? Upon which, he states it as a well-known fact, the sailors, while they thought themselves still out at sea, very often ran aground by night, and which was familiarly called by them *στῆθις*, or the breast; as in Latin, the term *dorsum*, or the back, was applied to the same formation. It is clear, from the French chart, and from our own frigate's track and soundings, that no vestige of it now remains in that sea. Polybius ascribes its existence to what we see continually taking place upon a small scale in a mill-stream; namely, that the impetus of the water carries out the alluvium, which it brings down from the interior of the country, to a certain distance into the sea; and that when that impetus begins to slacken, the deposit of sediment commences, and forms a bank, not continuous with the land at the mouth of the river, but at a certain distance from it, according to the propelling force of the stream. Nor is the notice of this bank confined to Polybius alone: Strabo also mentions it by the name of *στῆθις*, as a thing publicly and familiarly known to his readers; although Arrian, who enumerates the mouths

of the rivers, makes no allusion to it. We cannot doubt, then, that it did exist, and yet we can now find no traces of it ; and we must either therefore suppose that the weight of **water** has been sufficient at some time or other to disperse this accumulation altogether, which it had before assisted to form, or that the land at the mouth of the river has so increased since Polybius and Strabo wrote, that what was in their days a bank, at a distance of thirty-five or forty miles, upon a very moderate computation for a day's sail, has now become an integral part of the continent of Europe. In the account of Captain J. Smith's voyage from Varna to the Crimea, before quoted from Purchas, he gives us a lively picture of the process by which such an event was then going on, though it does not appear exactly where. He saw what appeared like high black rocks, but which were, in fact, only trees, weeds, and mud, brought down the river, ' of which as they sailed they saw many *without sight of land*, seeming like high rocks or low islands, which are only great flats of osier-quagmire, where infinite heaps of trees do stick, and by their weight, time, and multitudes, though the boughs rot, the bodies they say have made many of these osier-flats firm land in many places.' This is from an eye-witness ; and whoever looks upon the great map of the Russian dominions belonging to this society will see, that while the coast north and south of the Danube seems to show what was the original line throughout, there is a very considerable projection beyond that line all about the mouths of the river, which would appear to favour the latter supposition ; but in the absence of the authority of any modern geographer or traveller who has visited the spot, it is difficult to form any certain opinion upon the subject ; and we must again class the accurate solution of this question among our desiderata.

Dr. Clarke, though willing to appear conversant with the ancient authors, makes no allusion to the former existence of this bank. In one passage of his work he considers the discharge of water from the Danube as small ; but, in another, he finds its colour and freshness extending above three leagues out to sea ; and says again, that at one league the water was fit for use, and at five leagues and a half very little brackish ; indications, one would imagine, that should have made him expunge from his work the former opinion of the smallness of the discharge of fresh water from this great drain of Europe.

On the 20th of November, the *Blonde* arrived at Varna, which we have before said to be the ancient Odessus of this latitude ; and which was another offspring of Miletus, so fruitful in colonies. She there found excellent anchorage in nine fathoms water, in a gulph easy of access, and yet sheltered from every quarter but the east and south-east ; from which, however, the wind is there said never to blow home. But there was no more opportunity for observation here than at other places ; and on the 23d, she proceeded on

her voyage, passing Cape Emineh, the extremity of the ancient range of Hæmus, which projects into the sea, evidently the same name with Hæmoni; which, as well as Emona, a small town or fort, once standing at the extremity of the range, retains the traces of the classical appellation of the Balkan.

Standing on from thence towards the gulph of Bourgas, she passed the town of Missembri, the ancient Μεσημβρία of Arrian and Strabo, &c., and which Herodotus* says was founded by the Byzantines, who, at the approach of the invading forces of Darius, fled from their native city, and took refuge in the Euxine. Arrian says, there was here a harbour, and that its distance from Cape Emineh was ninety stadia; which same space, measured upon the chart, is now about nine geographical miles. From Mesembria to Anchialus, he says, are seventy stadia more; and at seven geographical miles we now find the town of Abiouli, preserving, no doubt, the remnant of its ancient name; and, in both instances, we have a result of ten stadia to the geographical mile, or six hundred to a degree.

At Bourgas, the frigate again anchored; but as the plague was raging there, had no communication with the shore, and only remained during a single night. From thence she passed Siseboli, the ancient Apollonia, and another colony of Miletus, where was a temple of Apollo, from which, as we learn from Pliny†, in a chapter upon ancient and colossal sculpture, Lucullus carried off to Rome a statue of the god, which he afterwards erected in the Capitol, whose height was thirty cubits, and its cost one hundred and fifty talents, or, as some read the place, five hundred talents. The modern name of Siseboli retains nothing apparently of the ancient Apollonia; but we recognize in it, without any difficulty, the traces of a name it is said by D'Anville to have borne in after times, Sozopolis. The Blonde here entered the harbour in fifteen fathoms water, where she found two Russian two-deckers, a frigate, and other vessels; but, without letting go her anchor, she proceeded on her return; and after passing Cape Naida, she saw nothing more of the land until she again reached the Bosphorus.

The facts of her voyage are few, and of themselves uninteresting; except always that, simple as they are, they form a feature in our naval history which we cannot elsewhere find throughout its range. In the paucity, however, of our information, relative to the actual state of the shores of the Black Sea, they are worth recording; and, taken in connexion with the different periods of the Greek and Roman settlements in this sea, they cannot but possess a very considerable interest for the geographer, however imperfectly I may have succeeded in illustrating them.

* αἰχμαλωτίζοντες αὐτοὺς τὴν σφετέρην, ἔσω ἐς τὸν Εὐξείνιον πέλαγον καὶ ἐκεῖ αὐτὰ πόλιν Μισσαμβρίαν οἰκοδόμησαν.—Herodot. vi. 33.

† Lib. xxxiv. cap. 7.

MAROCCO, from Observations IN 1830.

Geographical Positions			Authorities
Lat. N.	Long. E.		
35° 34' 30"	5° 11' 0"	{ Tolme	{ M ^r Washington E.S. (1830)
35° 30' 0"	5° 14' 0"		
35° 27' 30"	5° 18' 0"		
35° 24' 0"	5° 21' 0"	{ L ^{ts} Smith R.A.	
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35° 12' 0"	5° 33' 0"	{ Radar (1804)	
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34° 54' 0"	5° 51' 0"	{ Radar (1804)	
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X.—*Geographical Notice of the Empire of Marocco.* By Lieutenant Washington, R.N. Read 11th and 25th April, 1831.

Of the empire of Marocco, the principal cities and the manners and customs of its inhabitants have been often described; but of the geography of the country, of the positions of the different towns, of the line of sea-coast, of the course of its rivers, of the height of its mountains and elevated plains, and of its geological structure and general features, our knowledge is very imperfect.

A brief but accurate notice of such information as was obtained in a journey to and from the city of Marocco and the Atlas mountains, and during a residence of one month in the capital in the winter of 1829-30, is contained in the following pages.

The party destined to form the mission to Marocco assembled, in the beginning of November, at the hospitable British consulate at Tangier, which town, situated on a steep acclivity rising at once from the beach, presents its eastern and not unpleasing aspect to a bay about three miles wide. It is surrounded by mouldering walls, round and square towers every sixty paces, and three strong gates. Its defences towards the sea are two batteries, one above the other, on the south side of the sea-gate. Directly in front of the landing place, high on the wall, are about twelve guns; to the north, in a circular battery commanding the bay, about twenty guns of all calibres, mounted on clumsy Moorish carriages, which would not stand fire for ten minutes; crowning all, to the north, is an old and extensive castle, L'Kassbah, and the residence of the governor. On the land side, ruined walls and a ditch are the only defences. The gates are shut at sunset, and a watch is kept by night.

El Jamāa Kibeer, or principal mosque, is large and rather handsome. Its *smā* or tower, placed at the north-west angle, lofty, and wrought in coloured tessellated work; as is also the pavement of the mosque, round which stands a colonnade of low pillars, with a fountain in the centre.

The streets, except the main street which crosses the town irregularly from the sea to the land gate, are narrow and crooked. The houses low, with flat tops, except those of the European consuls, which are many of them good.

In an open space about the middle of the main street there is a vegetable and fruit market. But the principal one, *Sōk el Wāhad*, is held on Sunday, outside the western gate, and well supplied with poultry, game, vegetables, dates, fruit, &c. Meat is good and cheap.

This town is the residence of a bashaw, whose territory extends about twenty-five miles to the southward.

Outside the walls are some productive gardens belonging to the

different consuls resident here, who are sufficient to form a very agreeable society. From a terrace in that of the Swedish consul is an extensive and pleasing view over the town of Tangier and its bay at your feet; the distant peaks of the Lesser Atlas in the south-east; and to the north, across the dark blue waters of the Straits, the coast of Spain, from the memorable Cape Trafalgar, to the rock of Gibraltar. The anchorage in the bay is very tolerable, except in strong north-west winds. Were the mole rebuilt, the remains of which are still visible under water, the landing on the beach would be always secure. The ruins of old Tangier, possibly ancient Tingis, and a Roman bridge, are yet standing at the southern part of the bay. Four small batteries, of about six guns each, defend the sand-hills around the shores.

Population of Tangier, from 7000 to 8000, including 1500 Jews, who are the chief artisans.

Itinerary, 1st day, November 9, 1829.

The British embassy, consisting of a party of officers, the interpreter, a motley group of Moors, Arabs, and Jews, as muleteers and servants, escorted by a body of Moorish cavalry, accompanied by the Bashà of the province with his troops, and all the European consuls, to do honour to the mission, left Tangier, the road leading in a south direction, over a sandy soil, through the productive gardens that surround the town; then through an undulating country, over rounded schistose hills, about three hundred feet high; mica slate, with veins of foliated quartz, occurring rarely; direction, north-west and south-east; dip of strata, 75° to south-west; and covered with scanty herbage; passing occasionally an Arab village of a few hovels, fenced by a hedge of aloes and prickly pear, or Indian fig*; here and there a patch of Guinea corn, otherwise no signs of cultivation; at eight miles reached our first encampment, a well-chosen spot in a valley, surrounded by an amphitheatre of hills, the distant ranges in the south-east quarter stretching far away towards Cape Negro. We arrived at dusk, and found the tents ready pitched; and when, shortly after, the broad full moon rose above the mountains in the east, the scene was beautiful and picturesque indeed. On each side of the round handsome tent of our Moorish leader, *Sidi Mohammed*, striped blue and white, and surmounted by a gilt globe, were the other tents, forming a circle, with the Arabs and baggage in the centre; camels, horses, and mules piqueted around; here and there a group of Moors, their swarthy faces lighted up by the watch-fires over which they were leaning; and when the Moslems began their chaunt of the *Slât el Ashar*, or evening prayer, it completed a scene that we had all read descriptions

* Cactus *Opuntia* (Kermuse d'Ensarrab, *i. e.*, Christian fig.)

of in our youthful days, but which none of the party had seen realized till this moment.

Itinerary, 2d day, November 10.

Shortly before dawn of day roused by the manly voice of our chief joining with all his troops in his morning prayers; and such was the practice, not only this morning, but ever after on the journey. Be the weather what it would—rain and storm, or fine and calm—long before day were the Musselims prostrate on the earth, chaunting the prescribed chapter of their sacred Korān.

Road to-day in a S. by W. direction 10 miles, over the well-wooded hill *Dāhr Acclaou*; cork, wild olive, *droo*, myrtle, heath, broom, palmetto, &c.; masses of rifted sandstone scattered about in wild confusion; soil, gravelly clay. From summit of this hill (500 feet), which is a western spur of the northern branch of the Lesser Atlas, an extensive view of bold mountain scenery in the east and north-east, even to Ape's Hill and the rock of Gibraltar, of Cape Spartel in the north, and of the wanderings of two rivers in the plain beneath, which join round the foot of this hill, and flow into the Atlantic Ocean at three miles west. Forded the *Wād Meshra'l Shef*, (or stony ford,) and encamped on an elevated plain (400 feet) at a tepid spring of water called *San'ya d'Ulad Sbaida*; passed five Arab villages, one *coubba*, or saint's tomb.

Itinerary, 3d day, November 11.

Marched 10 miles S., through a valley about eight miles wide, with many springs; bounded on the west by a hilly tract (500 feet), forming the sea-coast, distant about four miles; on the east by a range of bulky mountains (2500 feet) called *Djibbel Habeeb* (beloved hill); soil, light clay; little or no cultivation; a few fields of *drā**, or Guinea corn; passed four Arab villages, three *coubbas*, or sanctoria; encamped at entrance of *Fas y Rechan* (valley of myrtle). About two leagues east-north-east of this spot stands a curious rock, called *L'Ooted*, or pegrock, from description, like those we are accustomed in England to call Druidical.

Itinerary, 4th day, November 12.

Course S. 16 miles: first four over a plain of myrtle; then through a narrow valley half a mile broad, winding in a south and south-east direction, hence called the Camel's Neck; the latter part, over a plain of coarse herbage; soil, light clay and sand, with sandstone boulders; and through a wood of fine cork-trees, being the eastern extremity of *El Araïsh* forest. Encamped within two miles of *Al Kantra* (the bridge); scene of action between the Moors and Portuguese in 1578, where Don Sebastian, who has

* The word *durrah*, or *dhurrah*, pronounced rapidly, in the Moghrebine fashion. It is a kind of sorghum or millet.

the privilege of occasionally re-appearing, lost his life and crown. We thoroughly examined, sketched, measured and noted down this bridge, which is in good preservation, and still crosses *Wad el M'Hazen*. In the valley through which runs this river, and on its banks, the palma Christi, and various other shrubs; fine corn land to-day; rich alluvial soil; wild artichokes, thistles, &c.; a few patches of Guinea corn; hills to the west, forming sea-coast, wooded; several flocks of sheep; ten Arab villages; three *coubbas*, surrounded with wild olive and fig; some deserted gardens; several springs and wells*.

Itinerary, 5th day, November 13.

Course S.S.E. 10 miles, fine open country; soil, light loam; greater cultivation; much more populous; herds of cattle, horses, mules, flocks of sheep; passed ten Arab villages; three *coubbas*, dazzling white, embosomed in wild olive and fig plantations, forming a pretty contrast. From a rising-ground, beautiful view of the town of

Al Ksar (Kibeer), situated in a flat tract of rich, partially wooded meadow-land, through which meanders in a west-north-west direction, the river

L'Khos, a rapid but yellow stream; at this season of the year the channel about one hundred yards wide; the plain to the south-east bounded by beautiful mountain scenery. Conspicuous by its singular conical form is the peak of *Sarsar*, at the foot of which, said to be inhabited by Shereeffs, is the town of *Wazen*.

Al Ksar, situated on the northern bank of river, distant half a mile, surrounded by orchards and gardens of orange, pomegranate, and palm, in great luxuriance; was built by Jacob, son of the mighty *Al Mansor* (the victorious), about the end of the twelfth century, and connected in history with the wars of Granāda. The town is surrounded by old and ruinous walls of herring-bone brick-work and tapia, battlements, loop-holes, and small square towers, fifty paces apart, about one mile and a half in circumference. Rode through the streets; counted fourteen mosques, many of which were lighted up and spacious; streets narrow, and at intervals arched across; houses remarkable for having ridged roofs of tile—the only town in Barbary.

Al Kaisseria, or Bazaar, contains a few mean shops; no business doing; *sōcs* (markets) and *fondacs* (inns) deserted and lifeless. Population about eight thousand, of which five hundred may be Jews; but doubtless it had been much more populous†.

* It will be remarked that this Journal is simply geographical. During a journey of some hundred miles in this little known country, of course much other valuable information was gained, which it is hoped will soon be laid before the public.

† Jackson's estimate of the population in this country is, generally speaking, too exaggerated to require contradiction.

Some little trade in salt, which is procured from the neighbouring hills*. The weather at this season was deliciously fine; the early rains had fallen, and the air was mild—more like spring than the approach of winter; the nights heavenly, but especially this night was calm, still, and serene; every star in the heavens distinctly visible; Venus, as a globe of liquid fire, gradually declining in the west; nought to break the stillness but the occasional bark of the watch-dog, or the drowsy note of the Arab drum from the distant tents, whose inhabitants passed away the tedious hours of night by reciting their wild tale of war and love.

Itinerary, 6th and 7th days, November 14, 15.

Course S. W. 9 miles, W. by S. 12; over ground a succession of valleys, and low ranges of hills; one a mamillary range of two hundred feet, soil deep clay, and hills of gravel; boulders of ferruginous clay-stone; dried up thistles, and plants like fennel, called *el clagh* (gum ammoniac); several beds of mountain streams, east and west direction. At entrance of great plain of Mamōra, two tumuli; herds of cattle. As we enter the grazing country, Arab villages change into *douars*, or circular encampments of from twenty to thirty tents, seventeen of which we passed, and five *coubbas*. Approaching the Atlantic, sea visible from the heights.

Itinerary, 8th day, November 16.

Course S. W. 11 miles; reached the northern extremity of the large lake, twenty miles long by one and a half broad, of fresh water, called *Murja Ras ed Dowra* (or lake with the winding head), covered with wild-fowl; its western bank only a mile and a half from the Atlantic, separated by a range of sand-hills about two hundred and fifty feet high, covered with coarse herbage, and which rise about three-quarters of a mile from the western shore of the lake along which our road leads; soil light and sandy; a forest of *el clagh* (gum ammoniac); some plants ten feet high, stem five inches thick; such are the annuals in this prolific country. Five *coubbas*, ten *douars* on eastern bank of lake, a few trees, and herds of cattle.

* In examining the map of Don Juan Badia (Ali Bey), in Morocco (the only one that has any pretensions to accuracy), it must be allowed that where he *actually* did make observations, he is generally correct; but in compiling his map mistakes have arisen, possibly through the carelessness of the editor. It is not wished to detract from a work that undoubtedly has great merit, but facts must be stated clearly.

1. *Al Ksar* is placed 4', or 16" of time east of Tangier; it should be four miles west of Tangier.

2. The difference of longitude between Cape Spartel and El Araish is assumed at a mile and a half; it should be fifteen miles.

3. *El Araish* is placed seven miles and a half west of Tangier; it should be eighteen miles and a half. These mistakes occur within fifty miles of the point he started from. As for his plan of the city of Morocco, it must have been drawn at Paris from recollection, so unlike is it to the original.

Itinerary, 9th day, November 17.

Rode about 13 miles S. W., along the margin of the lake, in which are several islands with saints' tombs, insular spots being here, as elsewhere, sacred to holy purposes. Lake covered with wild-fowl of all sorts—widgeon, wild-duck, snipe, curlew, water-hens, dabchicks, herons, cormorants, besides plover and peewits : it produces fine eels ; soil light, sandy ; coarse herbage ; little or no cultivation ; no wood ; herds of cattle on opposite bank of lake ; distant mountains in the east, bounding the great plain of *Msharrah Roumella* ; passed fifteen douars : four coubbas to-day.

Itinerary, 10th day, November 18.

S.W. by S. 11 miles. Lake loses itself in a marshy stream ; country becomes hilly—highest five hundred feet ; soil gravelly and sandy ; colocynth and coarse herbage ; pass two coubbas, nine douars, three springs ; from summit of these hills of sandstone basis, view of the

Wād Seboo, winding in the boldest sweeps imaginable, through a rich and varied plain, far as the eye can reach ; descended a steep bank covered with broom, myrtle, juniper ; crossed the river, about four hundred yards wide ; a bar of sand, a quarter of a mile from its outlet, extends almost across, and nearly dry at low water spring tides ; inside from three to four fathoms water ; rise of tide seven or eight feet ; a good spring of water one hundred yards distant from the northern bank of the river opposite the town. Rode through the town of

Mehedīa, situated on a height of about ten feet, on the southern bank of the river, and distant one mile from the sea : when formerly in the possession of the Portuguese it was a place of some consequence, as the ruins of handsome fountains, arches, and churches attest ; its fortifications also were respectable ; a double wall, if not a ditch, on the south-western side ; a long low battery defended the beach and entrance of river, and the citadel commanded the whole ; at present eight guns mounted are its sole defence. The town now contains from three to four hundred inhabitants, chiefly fishermen, who subsist by the sale of shebbel, an excellent fish, much like salmon, which is caught here in great abundance. Water communication exists between this city and Fās, but is not taken advantage of.

Itinerary, 11th day, November 19.

Course S.S.W. 16 miles, through a narrow, deep valley ; lake on right three miles long ; on it four birds like swans, white bodies and necks, red feathers on the side, wings tipped with black, called by the Moors *El Boch 'Hhamar*, a variety (pink) of the *anas casarca*. Succession of hills and dales ; one mile and a

half from sea ; soil light ; sandstone basis ; to the east the extensive forest of

Mamōra, said to cover eighty miles of country ; on what authority is doubtful ; the only traveller who appears to have passed through this forest describes it 'as a wood of holm oak, almonds, lentises, and large willows, through which he journeyed in a few hours *.' Lions and wild boars, of which we saw traces, are its inhabitants. Passing under an aqueduct extending one mile south-east, its arches thirty feet high, eight wide, four thick—of masonry, and of antiquity, though it is difficult to say of what construction—but in good repair ; enter the town of

Slā, or *Sallée*, once the terror of the seas, so renowned for its rovers, whose daring exploits reached even to our own coasts of Christendom ; whose city and port were a constant scene of riot, and bustle, and activity—now, ruined, still, and lifeless : such are the fruits of ignorance, despotism, and Mohammedanism. The present town, built on a sandy point, extending to the sea, forming the north-eastern bank of the river, is about half a mile in length by a quarter in breadth, surrounded by walls thirty feet high, and square towers every fifty paces. Its defences, a long battery of twenty guns, facing the sea, a round fort at entrance of the river, and a gun or two on the gates. The mosques, arches, and fountains in the city, as we rode through it, showed traces of beautiful sculpture, and of great antiquity ; streets narrow, and houses sombre, like all Moorish towns. Population about ten thousand, of which five hundred may be Jews ; with apparently little or no occupation. The river

Bu Regreb, formed by the junction of the *Weroo* and *Bu Regreb*, is here about five hundred yards broad, when full. The bar, about one-eighth of a mile from entrance, runs almost across in a west-south-west direction, with three or four feet on it at low water, leaving a channel at each end ; the Moors use the eastern ; rise of tide nine or ten feet ; inside, the harbour is quite sheltered, with water for a frigate. The imperial dockyard is here ; a corvette on the stocks, destined to be launched when the freshes from the mountains, in the spring, force a passage over the bar. Several ferry-boats, three or four small traders, an Austrian prize, and a few fishing-boats, give an animation to this river quite uncommon to the Moors. The town of

Rabātt, standing on the south-western side of the river, fifty or sixty feet above its level, on banks of crumbling sand-stone. As seen from the opposite shore, the grouping of minarets, palm-trees, ruined walls, and old mosques, crowned by its venerable and battlemented *kassbah*, across a broad full river, is very picturesque. A curtain of five hundred yards, facing the sea, flanked by two cir-

cular batteries of twelve guns each, about as many more in the *kassbah*, or citadel, and a small battery overlooking the river at the south-western end of the town, form its sea defences. On the land side a strong wall, thirty feet high; square towers every fifty paces—of *tapia*-work, and angles of masonry. The town extends three-quarters of a mile in length, by one-third in breadth, and walled orchards of about two hundred acres reach along the banks of the river towards the ruined mosque, and lofty tower, one hundred and fifty feet in height, called by the Moors

Smā Hassan—the most conspicuous object, standing two hundred and twenty-feet above the level of the river, and the first by which this coast would be recognised in approaching from sea, as it must be visible from the deck of a frigate six or seven leagues. We counted here ten mosques, besides the mausoleum of a sultan, and that of the hero of Moorish Africa, the mighty *Al Mansor*. The main street of the town, which runs parallel to the river, contains the principal shops, not very attractive; the markets abundantly supplied with vegetables and fruit; orange orchards, vineyards, and cotton plantations, are extensive; the fruits excellent, though grown on a light sandy soil. Moorish population may be eighteen thousand; Jews, three thousand: the former appear wealthy; the latter, if so, dare not show it. The Jewesses certainly the prettiest in the empire. *Millāh*, or Jews' quarter, filthily dirty, but they are the chief artisans. One mile south-east of the town are the ruins of the Roman or Carthaginian town,

Shella. We were shown Roman coins said to have been dug up there. *Sala* was a place of note formerly, and, according to D'Anville, the limit of the Roman station on this coast. The river now called Bu Regreb, was the boundary of the ancient Mauritania.

Itinerary, 12th and 13th days, November 23, 24.

Leaving *Rabātt*, travelled 28 miles in a W.S.W. direction; the first eleven miles by the side of a well-constructed aqueduct, partly above, partly under ground, which abundantly supplies the town with excellent water; soil light and sandy; a palmetto desert. At seven miles passed the ruined village and high tower of

Tomara, distant about three miles from coast. In second day's journey crossed seven streams running into the sea, distant about one mile on our right; soil, light and sandy; palmetto and various bulbous roots; traces of wild boar; last few miles well wooded with wild olive, *dron*, palm, &c.; two Arab villages, and two tombs passed to-day; encamped under the walls of the deserted town of

El Mansorān, a square of one hundred and fifty paces, enclosing an Arab village; the tower of the mosque (eighty feet) stands one

hundred and eighty feet above the sea, from which it is distant a short mile, and would be visible six leagues from the deck of a frigate. Coast rocky and iron bound.

Itinerary, 14th day, November 25.

Course S.W. by W. 15 miles, through an undulating country, covered with a forest of underwood, as yesterday, and on our return in the spring, the ground enamelled with flowers as a carpet; soil, light sand and gravel; basis, clay slate; dip, 45° east, as observed on the banks of two streamlets crossed to-day; sea distant three-quarters of a mile; passed two Arab villages—two saints' tombs. At six miles from *El Mansoria*, stands the almost deserted town of

Fidallah, situated on the limit of a fine corn plain, at three-quarters of a mile from the sea, intended as a magazine for grain before Mogador was built; a walled square, of about two hundred and fifty paces, now encloses a respectable mosque, the ruins of European merchants' houses, and an Arab encampment; possibly three hundred inhabitants, Moors, Arabs, and Jews; half a mile to the westward, a rocky peninsula point, projecting one mile east-north-east, forms a sandy bay a mile and a half deep, offering a fair and well-sheltered roadstead to small merchant-ships.

Itinerary, 15th day, November 26.

W.S.W. 16 miles along the coast; sea distant three-quarters of a mile; soil, sandy; basis, sand-stone; no wood; herds of cattle; passed two tombs, one Arab encampment, two springs, one streamlet to-day.

Dar el Beida, a small walled town of half a mile square, standing on the beach, and on a point projecting north-north-east half a mile, forming a small bay three-quarters of a mile deep; a roadstead well sheltered from westerly winds, and protected by a few pieces of cannon. This town also was built for the exportation of corn, and was long in possession of the Portuguese; the towers of three mosques, and several good European-built houses, showed themselves over the battlements of the walls; many palm trees and numerous gardens surround the town; water in abundance. Population probably seven hundred, including Jews.

Itinerary, 16th and 17th days, November 27, 28.

S.W. by W. 33 miles, through a varied, undulating country; soil improving; fine loam; many gardens; a small forest of *droo*, a beautiful evergreen tree, much resembling the *arbutus* in leaf and blossom, bearing a brown berry, which affords a coarse kind of oil for burning; signs of cultivation; many ploughs at work; large plantations of 'lhenna*, the first seen on

* *Lawsonia inermis*.

the journey ; several springs ; herds of cattle ; flocks of sheep and goats ; passed eleven Arab camps—six tombs of saints. From rising ground gained sight of the windings of the river.

Oom-erbegh (mother of herbage), which, rising in the Atlas, separating the provinces of *Fās* and *Tedla*, forming the boundary between *Temsena* and *Ducaïla*, and flowing through deep banks of sandy clay ; about one hundred and fifty paces wide here ; falls into the sea ; on its south-western bank, one mile and a half from its outlet, stands the town

Azamôr.—Its tapia-built walls, a mile and a half in circuit, and crumbling to ruin, are, as it were, machicolated with storks' nests ; its defence is a few guns pointed seawards ; but a bar of sand across the mouth of the river, almost dry at low water, is its safeguard from any attack except by boats ;—and a barrier to trade. The town is dull and lifeless ; streets narrow and filthily dirty ; provisions, fish, vegetables, and fruit, abundant and good. Population may be three thousand, including Jews. At the south-eastern angle of the town is a suburb containing a mosque and a sanctuary. The country around open ; no wood ; but well cultivated, and many gardens ; soil, fine loam ; large plantations of 'bhenna, a field of which, of about six or eight acres, the *Kaïd* told us was worth to him about 100*l.* annually, producing, by irrigation, three crops a year.

Itinerary, 18th day, December 1.

Leaving *Azamôr*, ascended through a hilly country ; soil, light loam ; signs of greater cultivation, gardens, &c. ; several wells and springs ; passed ten Arab camps, two villages, with trees, &c., at seven miles ; a fine view of the town, bearing *west* four miles, called

*Mazagān**, situated on a peninsular point projecting north about one mile, and forming the western limit of a sandy bay about one mile and a half, affording a good roadstead for small vessels, the point of *Azamôr* sheltering it to the north-east. The town well built by the Portuguese, who abandoned it in 1770, and respectably defended towards the sea by several redoubts. It enjoys some little commerce, excellent water, and good supplies. Population, two thousand. About three miles to the south-westward of this place, on the sea-coast, are the ruins called

Tett (signifying, in Arabic, *Titus*). It has been suggested that it might have been founded by the Carthaginians ! Encamped in the valley at the back of the high land forming *Cape Blanco*.

* The various names of this town are worth remarking. In 1506, when first built, named by the Portuguese *Castillo Real* ; afterwards *Magazān* ; in 1507, by the Moors, owing to the vicinity of a saint's tomb, *Burja* ; in 1769, when besieged by the sultan *Sidi Mohammed*, *Ma'edūma* (*let it be destroyed*) ; and in 1770, when captured, by imperial proclamation, (*the New*) or *Jdeida*. This may account for mistakes in nomenclature and position, which we see even in the best charts and maps.

Itinerary, 19th day, December 2.

Course S. W. by S. 16 miles; road now quits the sea-coast, and assumes a more direct course towards the capital, across a series of elevated plains or table lands, stretching to the foot of Atlas, to which we ascend by three great steps. Enter the province of *Ducaïla*, celebrated for its breed of horses, and its woollen manufactory, in the shape of sulhams, 'haicks, carpets, &c.; soil of the plain, light loam, covered with stones, flint, &c.; eight Arab camps; five tombs; several springs and wells; much cultivation; gardens; fields of Indian corn; a few scattered palm-trees, otherwise no wood; ascended by a rocky road, hard sand-stone basis, about three hundred feet, on to an elevated plain, reaching to the horizon, except in the south-east quarter, where is a solitary hill, called *Gibbel 'Khaddār* (or green mountain), much resembling the 'lone Soracte,' rising in the Campagna di Roma.

Itinerary, 20th and 21st days, December 3, 4.

Course S.S.W. 14 miles, over an open plain, rather ascending; soil, light loam, stony: stunted palm; palmetto; a few flocks of sheep; herds of cattle; ten Arab encampments; seven saints' tombs;—from summit of plain caught first glimpse of

Atlas;—At sunset, splendid view of the snowy peaks of the long looked for Atlas, which we now see in all their glory lighted up by the western sun; an extensive plain in every direction, and apparently reaching to their feet; the masses of snow before us are magnificent, but detached, as seen from this distance, upwards of a hundred miles; the whole group bounding the arc of the horizon between south-east by south, and south by west; the highest isolated peak south-south-east.

Itinerary, 22d and 23d days, December 5, 6.

S.E. by S. 30 miles; still journeying over an extensive plain far as the eye can reach; at times not a tree nor a building, except a solitary saint's tomb, to break the level. Seeing a horseman or tall camel on the horizon is like meeting a ship at sea; first his head, then his body, then the animal on which he rides, is visible. Soil of the plain, light loam, occasionally sandy and gravelly; palmetto and colocynth occurring in swampy spots; fine grass occasionally; patches of Guinea corn; gardens; twelve tombs; twenty Arab encampments; the tents now take the form of bee-hives, and are usually rudely thatched with straw. Passed a large market to-day, held in the midst of the great plain; camels, horses, mules, asses, rude implements of husbandry, coarse woollen manufactures, corn, vegetables, fruit, dates, almonds, 'lhenna, &c., exposed for sale; snowy peaks of Atlas beautifully silvered by the meridian sun; encamped at the foot of a semi-circular range of small hills, varying from one hundred to one

hundred and fifty feet; gravel; on summit of one of the highest stands the ruin of a building named

Gherando, either a fort or watch-tower; circular, and apparently fifty feet high by twenty in diameter; none of the peasantry could say when or why constructed. From camp, eighteen saints' tombs in sight*.

Itinerary, 24th and 25th days, December 7, 8.

Course S.E. by S. 40 miles; road gradually ascends, about two hundred feet, through a broken hilly country of clay-slate, on to the plain of *Smira*, extending about twelve miles; then again ascends two hundred feet on to a second plain, seventeen miles in extent, named

Peira—basis of clay-slate; soil at times sandy, then decomposed slate; many stones; fragments of quartz; flints; much agate embedded in crystallized quartz; some very beautiful specimens; and covered with palmetto and coarse herbage; with a thorny tree, about twenty feet high, bearing a dark yellow berry, called *sidra nebach*, the *rhamnus infectorius*, (or yellow-berried buckthorn.) Encamped at the foot of a range of hills, varying from five to twelve hundred feet in height; schistose, with veins of quartz; strata in a north by east and south by west direction, dip 75° ; and forming the northern boundary of the plain of Morocco; during our ride across these two plains, not a hut to be seen except at our night's encampment, and but one spring of water; herds of gazelles and wild boar.

Itinerary, 26th day, December 9.

Course S. by E. 12 miles; ascending about two hundred feet, between hills of micaceous schist; torrent bed fringed with Spanish broom, *sidra nebach*, and acacia; road stony, boulders of iron, stone, &c., and flints. On debouching from this rocky defile, the imperial city, with its buildings, its mosques, its minarets, and lofty tower, in a large plain, in the midst of a forest of palms, backed by the eternal snows of Atlas, rising to the height of eleven thousand feet, and brought forward in striking relief from the deep blue sky behind them—burst on our view. While we gazed with delight on this beautiful prospect, our Moorish leader, on first sight of *Morocco*, halted his troops, and one and all offered up prayers for the health of the sultan their master, and thanksgiving for the happy termination of their journey; encamped for the night under the shade of the palm trees; the contrast striking between this emblem of tropical and burning

* The clear-sighted people of this empire, it is believed, do not wish their country to be surveyed. They should not canonize so many of their idiots, or build so many saints' tombs; for did an observer wish to select stations for a trigonometrical survey of their plains, nothing could have been better placed than these sanctuaries, and which it is a point of their religion to keep in good preservation.

climes, and the snowy mountains, now rising almost immediately above our heads ; at sunset many of the peaks still lighted up, while all below lies buried in one mass of shadow.

Itinerary, 27th day, December 10.

Cross the river *Tensift*, at *Al Kantra*, a bridge of thirty pointed arches, and continue over a perfectly level plain, through a forest of palms, towards the city ; accompanied by the sultan's guards, all in white clothing, and the whole of the troops and male population of *Marocco*, not less than forty thousand persons ; spirited charging of cavalry ; firing of guns and crackers ; barbarous music ; incessant shouting ; bawling, and piercing screams of women ! in short, suffice it to say, every honour that could be offered, attended us as we advanced.—At high noon—at the moment the white flags were waving from the summits of the minarets, and the loud and deep voice of the *Mueddin* was heard from the lofty towers of the mosques, calling on the faithful Musselins to acknowledge that ‘ there is no God but one God, and that Mohammed is his Prophet ’—did we unbelieving Nazarenes enter the imperial city of *Marocco*. An abrupt turn brought us to our quarters, in a vast garden, ‘ at once silent, shaded, verdant, and cool,’ and where we were at full liberty to take our repose.

MAROCCHO.

The plain of *Marocco* extends in an east and west direction, between a low range of schistose hills to the north, and the lofty *Atlas* to the south, about twenty-five miles wide, and apparently a dead flat to the foot of the mountains, which rise abruptly to the height of eleven thousand feet, their peaks covered with snow. This plain, which has no limit as far as the eye can reach east or west, lying about fifteen hundred feet above the level of the sea, the soil of a light sandy loam, with numerous rolled stones of crystallized quartz, agates, flints, porphyry, a green stone, cornelions, &c. &c., is, generally speaking, covered with low brushwood of the thorny plant called *sidra nebach*, or buckthorn ; the banks of the streamlets fringed with oleanders in great beauty, while to the north of the city is a forest of palm-trees and olives. The river

Tensift, springing from the northern hills about forty miles eastward of the city, flows along at their base about four miles north of *Marocco*, and joined by several streamlets from *Atlas*, reaches the Atlantic fifteen miles south of *Saffy*, nearly one hundred miles distant ; the river is shallow, but rapid ; the channel here about three hundred yards wide, but fordable, except in the spring, in almost all places. The

City of Marocco, lying on the northern side of this rich plain, is surrounded by a strongly built, machicolated wall of *tapia-work*,

thirty feet high*, with foundations of masonry; square towers about every fifty paces; the whole nearly six miles in circuit, entered by eleven strong double gates. But this vast area is far from being generally covered with buildings; it comprises large gardens, and open spaces from twenty to thirty acres in extent; the Sultan's

Palace stands on the south of the city, facing the Atlas, outside the main wall; but enclosed within walls of equal strength, is a large space of about fifteen hundred yards long, by six hundred wide, divided into squares laid out in gardens, round which are detached pavilions, forming the imperial residence; the floors of the rooms tessellated with various coloured tiles; otherwise quite plain; a mat, a small carpet at one end, and some cushions, form the furniture.

Mosques within the city are nineteen, two emdrasas or colleges, and one hospital; the principal of these called

El Koutubā, stands alone in a deserted space of twenty or thirty acres, conspicuous above all by its lofty square tower, rising to the height of two hundred and twenty feet, without diminishing, thus producing a striking and singular effect—divided into seven stories, and its height apparently about seven times its diameter: this tower is similar to, and said to be coeval with the *Smā Hassān* at *Rabbātt*, and the *Giralda* at Seville, built towards the end of the twelfth century. (Only be it remembered that the present superstructure of the tower of Seville is Saracenic, and raised by Christians on the Moorish foundations in the thirteenth century.) On the summit of the tower is a small turret in the shape of a lantern, whence it derives the name *Smā el Fanār*. The body of the mosque, though large, is an irregular building, and insignificant when contrasted with the lofty tower by which it is surmounted.

Benī Yūsef, next in height, and in age, though modernized and well painted, has a college of *tālebs* (or seekers, *i. e.* students) attached to it; a saint's tomb stands opposite its south door, formed of three arches, surmounted by a cupola, delicately wrought with rich Saracenic tracery.

El Moazīn, said to be the most ancient, is very large, and has several courts opening into each other; the Moorish horseshoe arches highly sculptured, intersecting in various directions, have a rich effect; attached to this mosque are gates, said to be those of Seville, the triumph of the mighty *Al Mansōr*.

Bel Abbās, patron saint of the city; mausoleum: sanctuary; mosque, and hospital containing one thousand five hundred patients. Its style of building, a pavilion, surmounted by a cupola covered with green and varnished tiles.

* See Plan of City.

Emdrasa dēl Emshīa.—College and mosque, stands near the south wall of the city; here are the sepulchres of the sultans of the *Molūc Saidīa* dynasty, once adorned with statues and busts, now, thanks to the bigotry of a rigid *Moslem* emperor, entirely effaced.

Fountains.—Several of these have traces of delicate sculpture, especially one near the mosque *El Moazin*, called

Shrub-ū-Shoof, ('drink and admire,') which has a cornice of white marble, shewing evident remains of former beauty.

Gates.—Of the eleven gates of the city, now open, that entering the palace, called

Bēb e'Rōm, is by far the best specimen of architecture to be seen; a Moorish horseshoe arch, (which, however false in principle, is not displeasing to the eye,) richly sculptured in Arabesque work, in imitation of shoe-nails, &c. &c.: its name would imply that it was the work of Europeans, or—of Romans! the same word being used for both.

Streets of Marocco are narrow and irregular, seldom wider than lanes in Europe, in many cases connected across by arches and gates, possibly as a defence in case of attack; several open spaces, which cannot be called squares, used as market-places, &c.; the

Houses, usually one story, flat roof and terrace, the side towards the street plain and whitewashed; here and there a narrow opening, not deserving the name of a window, none of which are glazed; but the interior disposition is much like the Spanish; rooms opening into a court, sometimes surrounded with arcades, and a fountain in the centre; many of the doors of cypress-wood, highly sculptured; the rooms long and narrow, owing probably to their want of timber; no windows, no fires, no furniture, except a mat and a cushion or two.

Al Kaisserīa, or Bazaar, is a long range of shops, or rather stalls, covered in from the weather, and divided into compartments; exposed for sale, were silk scarfs, shawls, and handkerchiefs, from *Fas*; *Sulhams*, *haicks*; *jellabīas*, and carpets, from *Ducaila*; cloth, linen, hardware, tea and sugar, from London! almonds, raisins, *'hhenna*, and *al kohol*, from *Suse*; very fine corn, caravances, beans, &c., from *Shragma*; very luscious *dates*, from *Tafilet*; and abundance of boots, slippers, saddles, coarse pottery, mats, cord, &c., of domestic manufacture; and embroidery in gold and silver, in which they particularly excel.

Markets.—There are two or three; the principal is called

Sōk el Khamīse, held near the north gate of the city, and, as its name denotes, on a Thursday; well supplied with home manufactures; outside the gate is the market for camels, horses, mules, horned cattle, sheep, &c., but no great show; not much bustle except in the sale of horses, which is by auction—the auctioneer

pacing the animal rapidly to and fro, and vociferating the last price named.

Tan-yard.—Visited, and thoroughly examined a large one, said to employ one thousand five hundred persons ! Great want of order and arrangement ; the process of dyeing was gone through for our satisfaction, and, in spite of dirt and slovenliness, a bright yellow colour was produced which is considered inimitable in Europe. The

Millāh, or Jews' quarter, is a walled enclosure of about a mile and a half in circuit, at the south-eastern angle of the city ; populous but filthily dirty ; all the Jews pay a capitation tax to the sultan, and are treated with the greatest contempt ; we were offered for sale by the *Scheik* of the Jews and a *Rabbi*, the only copy of the New Testament in Hebrew and Spanish, the last relic of the Spanish hospicio that once existed within these walls. Mohammedanism, with its withering influence, reigns undisturbed. Population cannot exceed one hundred thousand, perhaps not above eighty thousand, including five thousand Jews ; the women rarely showing themselves in the streets makes it difficult to estimate, but here are traces of a much greater population. The dreadful plague, and more dreadful famine, that visited this country a few years since, have committed fearful ravages ; not half the space within the gates is now inhabited ; ruined walls and tenantless houses meet one at every turn ; nothing flourishes but vegetation, which, even in the months of December and January, is rife and luxuriant—its springing freshness forming a striking contrast to the mouldering walls around.

Aqueducts.—Extensive under-ground aqueducts surround the town ; some ten or twelve feet deep, but chiefly in ruins ; they reach across the plain to the foot of Atlas, in many cases twenty miles in extent ; evident signs of a more numerous population, and far greater cultivation of the arts.

Cemeteries.—Several large cemeteries outside the walls, both to the north and south, but especially to the east of the city is one upwards of a hundred acres in extent ; war, plague, and famine, have thickly tenanted them.

Gardens.—The sultan has three large gardens, of about fifteen acres in extent, within the city, and two of about twenty acres each two miles distant from the walls, through all which we rode.

Jenān en Nīl, so called from the abundance of water with which it is supplied, certainly not on account of containing the productions of the country of the Nile, as it has no exotics whatever*.

Jenān el Afia (or prosperity), destined to the use of the sultan.

Jenān el 'Hassīra, remarkable for its fine grapes, about two miles east of the city.

* See Jackson's *Morocco*.

Semelalia, about two miles to the north-west of the Ducaila gate; fine olive plantations; and the residence of *Don Juan Badia* during his stay in this country in 1804.

The quarters allotted to the British mission during its residence of a month in Morocco was one of the sultan's gardens, at the south-west angle of the city, called

Sebt el Mahmōnīa, covering an extent of fifteen acres, planted in the wilderness style, with every variety of fruit-tree—olive, orange, pomegranate, citron, mulberry, walnut, peach, apple, pear, vine, &c.; with cedar, poplar, acacia, rose, myrtle, jasmin—forming a luxuriant and dense mass of foliage only broken by the solemn cypress and more stately palm, and through which nothing was to be seen but the snowy peaks of Atlas rising almost immediately above our heads, and the tall tower of the principal mosque distant about a quarter of a mile. Nought but the playfulness of gazelles, and the abundant trickling of water in every direction, to break the stillness of this delightful spot, combining everything to be desired in a burning clime,—silence, shade, verdure, and fragrance. But, as a contrast to the bounded view of our garden, the terraced roof of our house commanded a view over the city, the extensive plain boundless to the east and west, and the whole *dahir*, or belt, of the Atlas, girding, as it were, the country from the south-west to the north-east with a band of snow; and few days passed during our stay in Morocco that we did not spend the hours of sunrise and sunset gazing on this striking and beautiful object*, noting its masses and peaks of snow, and deploring that this mighty range, combining, within one day's journey, every variety of climate, from the torrid to the frigid zone, and offering such a field to the naturalist, the geologist, and the botanist, should still remain unexplored, and present an impassable barrier to civilization.

Viewed from Morocco, the snowy range of Atlas bounds the horizon from east to south-west. At this season of the year, (January, 1830) the transition immediate from the wooded to the snowy zone;—the formation inclines more towards sharp ridges and points than to Alpine peaks. The highest of these points, visible from the city, bore south-south-east, distant twenty-seven miles; two other remarkable masses, forming sugar-loaves, south-east by east and south-east, called by the Moors *Glaoui*—a high ridge from south to south-east. It is remarkable that neither Moors nor Arabs have any distinguishing name for the *Atlas*. It is

* But description is not sufficient. Happily a very correct outline of Atlas, a panoramic view of the city of Morocco, with many other characteristic and spirited sketches of scenery in that country, were made during our journey by a friend and intelligent fellow-traveller, Mr. W. H. Smith, R.A., and which sketches, it is hoped, will soon be made public.

usually called *Djibbel Telj*, or snowy mountains, or takes the name of the province or district, as *Djibbel Tedla*; *Djibbel Misfywa*. The word *Atlas* is not known: whence is it derived? May it not be a Greek corruption of the Libyan or Berebber word, *Adrar*, or *Athraer*, signifying mountain?—Many of these heights were measured trigonometrically, on a base of seventeen miles, the highest of which, named by the Moors

Miltsin, stands in the district called *Misfywa*, in latitude $31^{\circ} 12' N.$, 27 miles S., $20^{\circ} E.$ of Marocco, and was found to be eleven thousand four hundred feet above the level of the sea. This is below the limit of perpetual snow assigned by Humboldt (Personal Narr., vol. i., p. 261); yet but once in twenty years had these summits been seen free from snow.

It is more than probable that these are not the highest summits of the Atlas range, which will possibly be found in the province of *Tedla*, about the source of the two great rivers *Oom-erbegh* and *Mulwia*, which, from the best information, appear to spring from opposite sides of the same mountain; but this is conjecture. Till measured in 1830, the height of *no* snowy peak of Atlas was ever ascertained—at least none such is on record—but there is on record a conjecture hazarded, as to their height, by Mr. Jackson, and proved, by quotations from Asiatic Transactions, &c., to be correct. Jackson's statement is—'that these mountains, which lie south-east of Marocco, are seen at sea twenty miles to the westward of Mogadore, and therefore at a distance of two hundred and forty-five miles, and consequently must have an elevation of twenty-nine thousand six hundred and ten feet*.' That these peaks might be visible from Mogadore, from which they bear *east by south* a hundred and twenty miles, is very possible; but it so happens that the highest peak visible from Mogadore bears *south-east* (true), and consequently must be part of the range clearly in sight to the south-west of Marocco, and distant only seventy miles from that place, and certainly inferior in height to those peaks south-east of this city. Thus does a distance of two hundred and forty-five miles dwindle to seventy, and the unassuming but actual height of eleven thousand four hundred feet must take the place of the astounding elevation of twenty-nine thousand six hundred and ten feet†!

On reference to the Astronomical Journal, there appear upwards of one hundred sights for determining the longitude of the city. Distances between moon and sun; moon, and stars east

* Jackson's Shabeeny, pp. 92, 3, and 4. London, 1820.

† This is noticed to correct mistakes, not from a desire of criticising Mr. Jackson's work, which is unquestionably the most useful on this country. He spoke the Occidental Arabic, or Mo'greb, fluently, and without which no intimate knowledge can be gained, independently of the marked contempt evinced by the Moors and Arabs for those who do not speak their language.

and west of her; and altitudes of the moon when in the prime vertical,— the mean of the results of which give the longitude of our garden at the south-west angle of the city:—

Long. $7^{\circ} 36'$ W. of Greenwich.

Lat. $31^{\circ} 37' 20''$ N. Mean of about 20 mer. alts. of the sun.

Var. $20\frac{1}{2}^{\circ}$ westerly,—by numerous observations by Schmalcalder's compass.

The remarkable stillness of the air in this plain must be noticed. Morning and evening generally a dead calm; light winds during the day; little or no rain, and this in the months of December and January; atmosphere usually clear.

Mean height of bar. at Morocco,	Inches.	{	Showing an elevation of 1450 ft. above the level of the sea*.
observed by two bars. reduced to mean temp. of 50° Fahr.	28.410		
Dec. and Jan. 1830 . . .			

Greatest height, Dec. 26, 1829 28.590 Fine weather, wind NE.

Least do. Dec. 20 . . .	28.250	{	Rain, wind S., cumulus and lightning in S.W.

Mean temp. of Fahrenheit's therm. in the shade between 6 A.M. and 6 P.M.	{	$56\frac{1}{2}^{\circ}$

Highest, Dec. 21, 1829 64° , wind S. W.

Lowest, Dec. 27 40° at daylight, N.E.

Highest in sun, Dec 18 118° at 2 P.M., calmt.

The inhabitants of this country may be divided into six classes—*Moors*, *Arabs*, *Shellûhs*, *Berēbers*, *Jews*, and *Negroes*.

The *Moors*, degenerate race of noble ancestors, are the descendants of those who were driven out of Spain when the conquest of Granada by Ferdinand and Isabella, and the flight of Boabdil el Chico, put an end to the Moorish dynasty in that country; these chiefly inhabit the towns, fill the high offices under government, and form the military; their language, the Mogreb, or occidental Arabic, intermixed with Spanish.

The *Arabs*, originally from the desert, overspread the plains, living in tents usually pitched in a circle, hence called *Douars*, and following a pastoral life. When the soil is unproductive, the herbage scanty, or their tents so full of fleas and vermin, that they can no longer rest in quiet, they decamp and seek another spot, a spring of water, or a saint's tomb, generally influencing the selection. The Arabs are hospitable, and when they promise may be trusted; yet, otherwise, they are great thieves. They are a hardy race, slightly made, and under the middle size; the girls, when young,

* Calculated by the table of M. Olmanns. inserted in the 'Annuaire' of 1830.

† In Mr. Washington's MS. a list of ascertained geographical positions within the empire of Morocco, with the authorities on which they respectively rest, is here introduced, for which see map.

are pretty; the women frightfully ugly, owing to exposure and hard work, as all domestic duties (a wide range in this country) fall upon them. Their language is the *Koreish*, or Arabic of the *Kōran*, though much corrupted.

Berēbers and *Shellūhs* inhabit the mountain range of Atlas; the former the north-eastern part, as far as the province of Tedla, the latter thence to the south-west; they live chiefly in villages of houses built of stones and mud, with slate roofs, occasionally in tents, and even in caves: their chief occupation is that of hunters, yet they cultivate the ground and rear many bees. Their mode of life renders them more robust and active than their neighbours of the plains; they are probably the aborigines of this country, direct descendants of Ham, and have been driven to the mountains by the incursions of the Arabs and Moors; their language has no resemblance to the Arabic, though many words of that language are in common use among the natives. It has long been a disputed point whether the *Shellūh* and *Berēber* are the same language: Jackson, who lived many years at Mogadore and Santa Cruz, declares they are not, and gives a specimen of eighteen words in the two languages, to show there is not the smallest resemblance. Of these eighteen words I have found five, in two different Berēber vocabularies, to be the same as in the Shellūh dialect. During our visit to the Atlas, we wrote down from the mouth of a native Shellūh, who had passed all his life there, some hundred words of that idiom. On our return home, finding that the British and Foreign Bible Society had lately acquired a translation of part of the Scriptures into one of the dialects of northern Africa, I applied to them, who most liberally showed me their vocabulary, which proved to be compiled from a manuscript in the Berēber language; upon comparing this with my own made among the Shellūhs, I found twenty words, in common use, exactly alike, a catalogue of which I subjoin:—

<i>English.</i>	<i>Arabic.</i>	<i>Berēber*.</i>	<i>Shellūh.</i>
Bread	El Khobs	Aghroum	Aghroom
Camel	Jimmel	Araam	Arume
Call (to)	Tsāta	Kerar (imp)	Ir-kerah
Dates	Tamar	Tene Icayn	Teene Icayn
Dinner	El-iftor	Imquilli	Imkelli
Eat (to)	Akal	En-nitch	Ai-nish

* My authorities for the Berēber, are ‘Hodgson on the Berebber Language,’ published in the American Philosophical Transactions, vol. iv., and another compiled by a Frenchman, long resident at Algiers, I believe M. Venture. See Appendix to Langlès’ French Translation of Hornemann’s Travels.

When these papers were read before the Society, it was asserted that these languages were not alike; in the conversation that arose after the reading was finished a contrary opinion was expressed, and it was intimated that Mr. Barrow (who is of the highest authority in any point connected with Africa) thought differently, upon which further inquiry was made—the result is given above.

English.	Arabic.	Berēber.	Shellūh.
Eyes	Ayūn	Allen	Alen
Feet	Rijlain	Etarran	Idarn
Give me	Ara	Efikie	Fikihie
Honey	Asel	Tament	Tamint
Man	Rajel	Erghaz	Argaz
Mountain	Jebel	Addrar	Adderar
Morning	S'bagh	Zik	Zik
Nose	Anf	Thinzarth	Tinzah
Slave	El abd	Isingham	Issemg'h
Sultan	Sultan	Aghoulid	Aglid
To-morrow	Elgad	Ezikkah	Azghah
Water	Elma	Aman	Aman
Village	Dshar	Theddert	Thedderth
Woman	Murrah	Temthout	Tamtoot
Year	Sanat	Esougaz	Acsougaz

These two languages cannot be very dissimilar, in fact I have little doubt that they are dialects of the same; further examination is necessary, and a knowledge of the circumstances under which the translation was formed; but if, as I strongly suspect to be the case, a vocabulary derived from a native of one of the *Kabyles* or clans, which inhabit Atlas south-east of Algiers, and that from a native of the mountains south of Marocco, prove to be the same, we shall have obtained a key to a language spoken throughout the mighty range of Atlas, and extending from *Baheereh* on the banks of the Nile, to Cape Noon on the Atlantic Ocean, a distance of more than two thousand miles; nay more, there is every reason to believe that the Berēber is the native idiom of all northern Africa, it is the language of the Mozabies; the Wadiegans; the Wugelans; the Tuaryks; and Berēber words may be traced on the confines of Egypt and Abyssinia.

Jews are in this country, as elsewhere, a living proof of the literal fulfilment of that prophecy delivered more than three thousand years ago,—‘Lo, the people shall dwell alone, and shall not be reckoned among the nations,’—Numbers xxiii. 9; and although ignorant of the existence of such a command, the Moors have strictly and literally complied with it, obliging them to live in a particular quarter of their cities. The Jews are a very numerous and serviceable body; they are the chief mechanics, interpreters, &c., and the medium through which all commercial business is carried on with Europeans; they are also obliged to submit to the most menial offices, as servants, porters, scavengers, &c. Despised and insulted by the Moors, whom they cheat on all occasions, they have no redress, but must submit to be abused, struck, nay, to be stoned by a Mussulman child, against whom, if a Jew lift up his hand, he will infallibly lose it; if passing a mosque, he must take off his slippers; if he meet any of the emperor's household, even the old

negresses, the late imperial concubines, the Jew must doff his slippers, and stand close to the wall till they pass; to such a state of degradation are the people chosen of God, the descendants of Abraham, brought in this country. Yet such persons are our official interpreters, nay more, our consular agents; as for repeating a message on terms of equality to an emperor, or a spirited remonstrance if necessary, they dare not for their lives. The

Negroes, who are not very numerous, are slaves, and here, as in more civilized countries, are articles of traffic; yet they sometimes reach stations of great importance, and gain their freedom; and thus even in benighted, barbarian Africa, that foulest stain on a nation's fame—is not half so black as in enlightened, Christian Europe:—the negro's character stands high for fidelity, the sultan's body-guard, the only standing army, is chiefly composed of these: it is now not above five thousand strong; but under Muley Ishmael is said to have reached one hundred thousand. The

Government of this country is absolutely despotic; the sultan is the head of the church and state, which are inseparable; Mohammedanism is their

Religion, and some of its bigoted tenets are rigidly enforced by the present possessor of the throne; in their religious duties, such as prescribed prayers, ablutions, &c., the Moors are very strict, even on a journey; they look on Christians as of no religion, and not without reason, since at Tangier, the residence of the European and American corps diplomatique, comprising ten or twelve consuls, with their attachés and dependants, there is but one Roman Catholic priest (Spanish it is believed); the six Protestant representatives, and their families, have not even the shadow of a minister of religion. Their

Laws, the will of a despot, who in the capital administers justice in person; in the provinces the *kalifa* or bashaw faithfully copies the despotism of his imperial master; yet judgment is generally correct, and always prompt; the ruling principle appears to be—keep the people poor, and they will not rebel. The

Revenue is derived from taxes paid in kind, one-tenth of corn, and one-twentieth of cattle; a capitation tax on all Jews, and fines on districts where crimes have been committed; but the revenue is uncertain, nay, often must be levied by force from some of the Arab tribes; the whole may amount to a million sterling. The

Military are a sort of militia called out when required; they receive no pay, but are furnished with a horse, and, when those of the provinces visit the capital, with a trifling present. The only standing army is the sultan's body-guard, before-mentioned; all the soldiers carry long muskets, which they use with great dexterity, firing at full gallop; they are hardy, sleeping usually on the ground without any extra covering, even in cold wet nights; but they are

not formidable, as they have no idea of the advantage of moving in masses; if their first charge is not decisive, they must be easily routed; many of them are good marksmen; the management of artillery in the field is beyond their comprehension. The

Education of the youth is confined to learning the *Korān*, which they are taught by rote in the schools, and the management of a horse and fire-arms.

Music is almost unknown; a rude pipe and more barbarous drum are in use, but after listening a long time no pretensions to harmony could be discovered, except among the *Shellūh* mountaineers, whose songs were plaintive and pleasing.

The Moors are generally a fine-looking race of men, of the middle stature, though at first sight their loose flowing dress gives them the appearance of large men; after middle age they become corpulent, both men and women, owing to their inactive life. They have usually good teeth; complexion of all shades, owing to their intercourse with the negroes, and we remarked the darker the colour generally the finer men, and more determined characters; the women, who are pretty when young, blacken their eye-lashes and eye-brows with *al kahol*, (lead ore,) and stain the tips of their fingers (as do also some of the men, the fops of this country it is presumed) with *'hhenna*, which is far from adding to their beauty, being of a deep orange colour. The

Dress of the Moors is picturesque and graceful; a shirt, with large sleeves, and drawers of ample dimensions, of white linen, over which by many is worn a *kaftan*, with short sleeves, buttoned to the shape, of bright yellow, or light blue cloth; a many-coloured silk sash round the waist, over this a white.

Haïck, a long light woollen, cotton, or silk mantle, worn as the Roman toga, and at times a sort of cloak, with a hood, called a

Sulhām, of blue, yet more generally of white casimere; a red cap, round which is wound some white muslin so as to form a turban, and slippers or boots of *yellow* Marocco leather; the *haïck* is worn by women as well as men, often the only garment, and at times so fine as to be transparent; the women always wear *red* slippers, and neither men nor women wear stockings. A

Jellabīa is a coarse serviceable garment, made of worsted, and worn by the poorer people, and cannot be better represented than by making a hole in the bottom of a sack for the head, and cutting the lower corners off for arm-holes.

The Jews are not allowed to wear colours; a black *bornoo*s, black cap, and black slippers, mark their degradation.

The usual food throughout the country is a dish called *Kūscāsū*, composed of mutton or fowls stewed with a few vegetables, served up in a large flat earthenware pan, filled to overflowing with granulated paste, forming a savoury and nutritious dish; this is placed

on the ground, round which sit cross-legged halt-a-dozen persons; chairs, tables, knives, forks, spoons, and plates, are superfluities unknown.

Coffee is not used. Tea very generally; at all hours of the day it is presented to visitors, otherwise water is the only beverage.

The Moors do not smoke tobacco, but take a great deal of snuff; they occasionally smoke the leaves of the *Hashīsha* (or hemp-plant), which appears to have much the soothing quality of opium, producing pleasing intoxication; they also make a sort of confection of the seed of this plant, called *Kēef*, which has the same properties, and to the use of which they are much addicted.

The characteristics of the Moor are *idleness, apathy, pride, ignorance, and sensuality*—though living in the most deplorable state of ignorance, they look with contempt on all others, terming them barbarians. Their *bigotry*, too, is excessive; on our journey to Morocco, a party of travellers that we met, after saluting the chief of our escort, said to him, ‘God preserve you from the contamination of the Kaffirs.’ On such occasions it is brought home to us with double force, how thankful should we Europeans be for the blessed light of Christianity. The sensuality of the Moors knows no bounds; the laws of nature cannot restrain it; the constant and often repeated application to the medical officer* attached to the mission was for stimulating drugs and cordials, even after their noxious qualities were pointed out;—decrepit old men, with one foot in the grave, would have given half their fortune for a few hours of invigorated youth. The day is usually lounged away in idleness:—except for the military exercise of *Lab el Barōd* (literally, playing powder), which consists in charging at full gallop, firing their guns, and stopping short, they seldom move from their lethargic state of apathy or drowsiness; yet with these vices they are hospitable and possessed of great fortitude under misfortune; ‘*Allah brā*,’ ‘God made it so,’ is their support under all afflictions. The people are generally healthy and long lived; the climate is unquestionably good, yet leprosy, ophthalmia, elephantiasis, hydrocele, and the venereal disease, are not uncommon; their remedies are simple, their whole materia medica consisting in a few herbs; but the dreadful scourge of this country, the plague, visits them nearly every twenty years, nor will they be induced to take any precautions against it.

Locusts also commit fearful ravages, occasionally devouring every green leaf, and leaving the ground over which they have passed absolutely barren. But the pride of the Moor is his

Horse, and often, indeed, it is an animal of great beauty; has

* Mr. Williams, R.A., who, by his readiness to give advice and assistance to the natives on all occasions, kept them in good humour, and was enabled to obtain much information.

more stuff in him than the Andalusian jennet, probably owing to finer pasturage; his action and shape also differ; he does not raise his feet so high, and advances more; neither does he pace, but his usual step is a long walk; nor slip in his quarters as the Spanish horse; and is sure-footed even when galloping over rough ground, as we often proved, hunting both wild boar and gazelles. The horses usually stand from fourteen to fifteen hands high, of every colour; the most beautiful we remarked were chestnut and black; though the latter not common; flowing mane and tails, which they never dock, but when young shave the tail, giving it an absurd appearance; we measured the main of a chestnut horse two feet and a half long, the tail sweeping the ground; they seldom begin to ride them till four years old, nor do they ride the mares. In the interior of the country a good horse may sometimes be bought for one hundred Spanish dollars (twenty guineas), though with difficulty, and cannot be exported without an order from the emperor. On a journey the Barbary horse starts unfed and without water; at the end of it is piqueted, unbridled, never unsaddled; given as much water as he can drink, then barley and broken straw thrown down on the ground as far before him as he can reach by stretching out his neck; thus he rarely or never lies down, nor gets any sleep, yet is very spirited; broken wind is rare; they are often tender-footed, and much shaken in the shoulders from the sudden stop, even at full gallop, which is constantly practised

The audience with the sultan;—the interchange of presents,—namely, our choicest works of art, such as chronometers and telescopes, for the fiercest beasts of nature, as tigers, hyænas, wolves,—the honours paid to the British mission, &c., fall not within the limits of a geographical sketch.—To proceed then to the Atlas.

January 7, 1830.

Bade adieu to our earthly paradise, the garden of *El Mahmōnā*, and journeyed across the plain, in a south-east direction, towards the *Atlas*; soil, light, sandy loam, covered with rolled stones, and shrubs of the buckthorn and *tirnet* (resembling a gooseberry bush); several brooks of water, fringed with oleanders; large plantations of olives, and ruined aqueducts crossing the plain in various directions. At sixteen miles, entered a valley of the *Atlas*, winding in a south direction, and following the course of a mountain torrent; encamped for the night about two thousand four hundred feet above the level of the sea, and one thousand feet above the plain, commanding a splendid view of the city, the whole plain of Marocco, and the winding of the river, losing itself in the western horizon.

January 8.

At daylight, struck our tents, and set forward by a sharp ascent ; a brawling torrent in the valley below us ; its banks well wooded with olive, carooba*, walnut, acacia, cedar—the finest timber we had yet seen in the country, though not very large—and profusion of oleanders, stunted palms and rose-trees ; cheered and enlivened on our march by the shouts of the *Shellüh* huntsmen, re-echoed from rock to rock, in their endeavours to rouse the game ; each turn of the road disclosing fresh beauties in the valley, and a more boundless view of the plain and city of Marocco, its various mosques glittering in the morning sun ; basis of road, limestone ; soil, stiff clay ; stony ; boulders of limestone, sandstone, agate, flint, porphyry, gneiss, greenstone, and cornelian ; on brow of hill a range of limestone, fissures vertical, resembling a pile of gigantic tombstones, artificially placed ; passed several villages, perched in the most romantic situations, and inhabited by the free *Shellühs*, the aborigines of these mountains.

After about three hours' ascent, the paths becoming narrow, and intricate, we dismounted, left our Moorish escort, and put ourselves under the guidance of the *Shellüh* mountaineers—our only directions, pointing to the snowy peaks above our heads ; still ascending through a forest of *carooba*, olive, cedar, walnut, &c., overrun by wild vines, and the hop-plant in great luxuriance ; the scenery now becoming truly romantic ; abrupt, sterile, sand-stone mountains rising on each side of us ; the valley, not a quarter of a mile broad, through which rushed a brawling torrent five hundred feet below us, with the mountain path at times on the very brink of the precipice, while, before us, the snowy peaks appeared to recede as we climbed.

At noon, halted on the summit of a conical schistose hill, much decomposed at surface ; strata, east and west ; dip, 30° north-east, for a meridional observation, which gave our latitude $31^{\circ} 25\frac{1}{2}'$ N.,—the first ever perhaps taken in the Atlas. Our barometers here showed four thousand six hundred feet above the sea.

While making our observations we were surrounded by the native *Shellühs*, who gazed with astonishment at our persons—our dress, particularly the gilt buttons ; they silently looked at the compass, the spy-glass, the barometer, as things far beyond their comprehension ; but when the quicksilver was poured out for an artificial horizon, they burst out into an exclamation of mingled astonishment and admiration, but no incivility, no rudeness : the contrast between the apathy of the Moors and the intelligence and curiosity of these primitive mountaineers, is striking ; they have an air of freedom about them unknown in the plains ; well-formed, athletic men, not tall, not marked features, and light complexions.

* Al kharob, i. e. *ceratonia siliqua*.

Goitre is unknown among them; their language unintelligible to our interpreter, nor, generally speaking, did they understand Arabic. We conversed through the medium of the scheik of the Jews residing in this valley, and obtained correctly some hundred words of their language; they dwell in cottages, built of rough stones and mud, with slightly sloping slate roofs; their chief occupation is hunting; mix very little with the Arabs and Moors of the plain; wherever their valley afforded a spot of ground it was *enclosed* and cultivated; to us, they were hospitable and generous. In each village are many Jewish families, who have fled hither to avoid the degradation and taxation to which they are liable in the cities; this valley contains ten villages, between four and five thousand inhabitants, one-fourth of which are Jews. Saltpetre is found here, and good gunpowder made. Copper-mines are said to have been worked at the upper end of the valley. How little is known of the central recesses of the Atlas! Doubtless these valleys are all inhabited by a race of men probably as unmixed as any existing, of whom nothing is known, hardly even a few words of their language! Here is a field for an inquiring mind.

But to proceed: for two more hours continued ascending; ground covered with scanty herbage and stunted cedar; reached the limit of snow, and continued some distance above, till finding the thawing snow giving way under our feet, and our guides declaring they would no longer accompany us, we reluctantly halted, and gazed on the highest peaks, still far beyond our reach, the space between us and them one mass of untrodden snow. Our barometer here showed an elevation of six thousand four hundred feet. The mountain on which we stood was of hard red sand-stone, strata running in an east and west direction, dip 10° south; we had thus only passed limestone*, micaceous schist, and sand-stone, only transition and secondary rocks; no traces of the primitive, except

* This formation, it is believed, is of secondary limestone, and probably is generally diffused throughout the skirts of the Atlas, forming the basis of all the lower ranges of the mountains to the height, perhaps, of three or four thousand feet. Of marble we saw nothing in our journey, except in some of the buildings in Morocco; and, after much inquiry, could not decide, from the ignorance or apathy of the Moors, whence it came, but it is believed from Italy. The great columns and pillars of white marble yet existing in this country are between *Faz* and *Mekinez*, and described as the ruins of a triumphal arch and temple; but of *rosso-antico* and other ancient marbles, which have been, historically, almost proved to have come from Mauritania, we could hear nothing.

Of the age of Atlas it would be difficult to form a conjecture; but if the very plausible theory of M. Elie de Beaumont be correct, Atlas is of later date than the range of Erzgebirge in Saxony and the Cote d'or in Burgundy,—than the Pyrenees and the Apennines,—than the gigantic Mount Blanc and the south-western Alps, and probably coeval with Mont Gothard and the central Alps, the Caucasus, the Balkan, and the mighty range of Himalah in Asia,—that is, judging from the Alps in Switzerland of a comparatively recent date, or elevated since the deposition of both secondary and tertiary strata.

a boulder of granite or rather of gneiss in the valley below, and veins of foliated quartz in the schistose hills; besides, the tendency of the formation is to table-land, ridges, and rounded summits, not to sharp or Alpine peaks; neither did we on our route through the country, see any trace of volcanic agency, nor is there anything in the outline of Atlas indicating the former existence of a crater. Returned to our camp at night.

January 9.

On a hill five hundred feet above our camp are ruins of a city, now called *Tassremoot*, apparently of great extent; walls of unhewn limestone and mortar, baths, vaults, &c. All the information we could gain from the natives was, that it was formerly a Christian or Roman city, and tradition attaches to it the same tale as that of the taking of Troy, which, substituting mules laden with treasure, for the wooden horse, was distinctly related to us by a *Shellāh* huntsman, who, pointing to a certain spot in the wall, said, 'And there stood *Bāb el 'Ghraddār*,' or 'traitor's gate,' which name it bears to this day!

January 10.

After three nights spent in the *Atlas*, at dawn of the following day began to descend on our return to the plain; passed a basin formed by hills about five hundred feet in height, presenting a remarkable appearance; strata of lime running north-east and south-west, dip about 70° to south-east, and which, following the undulation of the hills, gave to the north-west slope the resemblance of a series of crescents rising one above another. Again reach the regions of palm, oleanders, rose-trees, &c.; on gaining the plain turn east-north-east, along the foot of a range of hills called the

Arina range, which presents a striking feature even as seen from Morocco; basis of lime; strata east and west, dip 20° to the south-east; its north-western face precipitous, five hundred feet high, and deeply channelled with water-courses, and having dark red clay, possibly metallic, between the strata of lime. Road turns north across the plain; soil light clay; ground covered with cornelians, agates, &c.; traversing numerous streamlets gushing from all the vallies of the *Atlas*; their margins rife with vegetation; cross the river *Tensift*, and lose sight of the tall tower of the mosque of *El Kōōtabīa*, which, towering as a light-house far above the level line of verdure formed by the tops of the palm-trees around Morocco, had hitherto been our beacon across the plain. Encamped close under the eastern extremity of the schistose range of hills, forming the northern limit of the plains and at the source of the river *Tensift*. The schistose hills, varying from

five to eight hundred feet in height, assume every variety of shape ; truncated cones, pyramidal, pine-apple, sugar-loaf, &c. ; one of which was covered with masses of gneiss, or cross-grained granite, abounding with black mica ; many of these blocks were several tons weight. How got they there ? If granite, the nearest granite mountains are at the distance of twenty-five or thirty miles. Can they be boulders ? They had rather the appearance of roughly quarried masses of four or five feet square.

January 11, 12, 13.

Left the plain of Marocco, and, striking through the schistose hills, again came on the extended plain which we had crossed forty miles to the westward, on our journey to the capital ; soil, fine loam ; irrigated and well cultivated ; a three days' journey of about fifty miles in a north-north-east direction, over this great plain, brought us to the banks of the river

Oom-erbegh, at the ford called *Meshra el 'Khalluf*, or ford of wild boar, many of which we hunted and killed during our day's journey ; the river here is not rapid ; about one hundred and fifty yards broad, and fordable ; it flows through banks of deep soil. During these fifty miles passed but twelve Arab encampments, and six saints' tombs ; much less population, but which may be accounted for by the land being destined to pasturage ; herds of cattle, flocks of sheep and goats.

January 15 to 21.

A journey of seventy miles across a series of plains, in a north-west direction, brings the traveller from the banks of the *Oom-erbegh* to the sea coast at *Fidallah* ; the former part of the plain gravelly ; a palmetto desert, but the latter part a fine rich soil ; thinly peopled and little cultivation ; but as the spring in this climate draws on, nature teems with life ; the ground rich in bulbs, flowers, &c., enamelled as a carpet, with iris, crocus, daffodil, narcissus, lotus, lupins, African marigolds, &c., in full bloom ; that gigantic annual also, the gum ammoniac plant, like fennel, already putting forth its shoots and feathery leaves. Thirty-three Arab encampments and twenty saints' tombs passed in five days' journey.

At twenty miles north of the *Oom-erbegh*, encamped at a spot which still bears the name of

Kaisār—name and tradition agree in pointing out this spot as of ancient times. We traced the foundation of a building whose north side was two hundred and fifty paces long ; round towers at the corners ; walls five feet thick, of rough unhewn limestone and mortar, but level with the ground ; other foundations are visible to a great extent ; a well and conduits leading to the spring. The writer has great pleasure in being able to give the remarks on this

station, of a very intelligent friend, (to whose kindness * he is indebted for having accompanied this mission,) and whose opinion as an antiquary and an acute observer, is valuable. ‘No coins could be produced, although their weight in gold was offered; still it was asserted that many had been found; that this has been a Mauritanian or Roman station is not improbable; extensive ruins certainly exist, near a fine spring of water, in a rich corn plain, and about half way between the present cities of Fas and Marocco, in nearly a direct line, and a very probable situation for a connecting station between those two cities, or whatever existed on their sites. On the following day, about twelve miles north of this spot, remarked several tumuli; on riding up to examine, found two of them circular, about twenty feet high, and one hundred feet in diameter, and one long barrow; on questioning the peasants who were ploughing the ground at their base, and inquiring whether there were any ruins near here, they replied, “that a city, called *Caria*, had sunk into the ground; that many well-built wells were in the neighbourhood; that coins had been found which they described as of *brass*, of the size of a Spanish dollar, and an inscription of straight sticks and dots.” Can this be other than the Roman denarius?’

The Jewish Rabbi, Shalôm Ezzowi, who lies buried at *Kaisâr*, is said to have been one who escaped from the destruction of Jerusalem by Titus, and as such was rendered due homage by the Rabbi and Jews of our party.

Halted for two days hunting in a fine open country at the

Kassbah dēz Zettāt, a walled square of two hundred and fifty paces, containing about five hundred inhabitants, Moors and Jews. In one morning’s sport, roused and hunted nine wild boars, several foxes, hares, &c. Gradually ascending from the immense plains of *Ducaïla*, till we reach their western limit, and again hear the welcome roaring of the Atlantic, which we had lost sight of for seven weeks, and arrive on the sea-coast, close to *Fidallah*; retrace our old road by *Rabâtt Mehediâ*, &c., till we reach the northern end of the great lake, when we continue northwards, passing through a small forest of cork, which is named after

Dar el Krisi, and along the eastern margin of the small lake

Muley Buselham; soil light sandy loam, richly covered with herbage; passed twelve Arab camps; eight saints’ tombs to-day.

* As also to that of Sir Thomas Fellowes, C.B., Captain of his Majesty’s ship Dartmouth, who kindly took upon himself the responsibility of giving him leave of absence from this ship then lying in Gibraltar Bay; nor is the writer unmindful of the cheerfulness with which his brother officers volunteered to do his share of duty while he was wandering in Africa.

January 30.

Twelve miles in a north direction, over rather a sandy soil, little cultivated, and skirting the cork forest of El Araish, about two leagues in extent, brings us to the town of

El Arāish, situated on an abrupt declivity of sand-stone, on the southern bank of the river El Kōs, at its outlet into the Atlantic; the town walled; a ditch on the land side, and crowned by a citadel; its sea-defences also are strong; a battery of thirteen guns half a mile west of the town, and a venerable castle, with concave flanks and orillons, at the entrance of the river. This town is a picturesque ruin; Christian foundations, desecrated by Moslem superstructures; the principal mosque was a Roman Catholic Church. Here was formerly the residence of the European consuls, and their deserted houses still line the Marina, commanding a fine view of the port and of the Atlantic; the town is fast falling to decay; population may be four thousand, including Jews; some little commerce in charcoal, &c.; supplies abundant; a fine spring of water on the northern shore, very convenient for watering shipping. The river

El Kōs, signifying a bow, and so named from its windings, may be traced through a beautiful valley far away to the eastward; its banks fertile, with many gardens, which fully justify the name of the town, '*El Arāis*,' signifying 'the Flower Garden;' an inscription over the walls, on the sea-gate, which we decyphered with some trouble, testifies that this place was taken from the Moors, and fortified by the Spaniards in 1610. A bar of sand lies in a N. by E., S. by W. direction, about two cables length from the point of the river, and on which are sixteen feet water, on spring tides, but within is a fair port for frigates, about three-quarters of a mile long, by a quarter broad, formed by the last winding or sea-reach of the river. Here were lying the two Moorish eighteen-gun brigs of war, the sultan's navy, which the Austrians attempted to burn in June, 1829, and, as is well known, failed, from gross ignorance of seamanship and gunnery;—they suffered severely:—we walked over the field of battle—a sandy point, under which twenty-six of their bodies lie buried; their heads were paraded for a short time on the line wall, then pickled and sent to the sultan; many of their bodies were impaled, and the Moors amused themselves by practising ball-firing at them as targets!

February 1.

Leaving *El Arāish*, road continues for ten miles along the beach; crossing ten streams running into the sea; hills at a quarter of a mile distant, varying from three to four hundred feet high, covered with herbage;—little wood. At six miles reach a bluff projecting cliff, named

Haffu el beïda (or White Cliff), from four to five hundred feet high, of a fine white claystone, its fissures or strata north and south, dip 70° to the east. Four miles farther quit the beach, and ascend the hills, covered with *droo*, palmetto, &c.; from summit, an extensive view of the line of coast towards Cape Spartel, and across the straits to the ever-memorable Cape of Trafalgar; descend to the shore, and reach the small town of

Arzilla, a walled square of a quarter of a mile, situated on the open beach; facing the sea are planted a few guns; the wall built by the Portuguese; many of the houses still preserve the pointed roof; population may be one thousand; country around varied and pretty.

February 2.

At three miles along the beach, ford the river *Ayasha*, and then ascend the elevated plain, and reach our former camp at *Sanya d'Ulad Sbaida*, where, after a delay of three days, waiting for the river

Meshra al Shef to become fordable, resumed our old road; and on the 6th of February, after a three months' absence, were again warmly welcomed to the British consulate at Tangier.

On reviewing the tract of country we had passed over, notice must be taken of the tendency to table-land observable throughout. Generally speaking, all the elevations present one level; the plains rise by three great steps to the mountains; and the two great rivers, the *Seboo* and the *Oom-erbegh*, appear to divide the country into three partitions: of these the northern, or that from the Straits of Gibraltar to the latitude of Fez, (excepting the northern spur of the mountains,) to judge from the bold sweeps of the rivers and the lakes, is nearly a level to the foot of Atlas. From the *Seboo* to the river *Oom-erbegh*, the country dips considerably towards the west, and still more so from this latter river to the plain of Morocco; throughout these plains there is great want of wood; even on the skirts of the Atlas the timber does not reach any great size, nothing that we saw to justify Pliny's account of timber in speaking of Mauritania, lib. v.

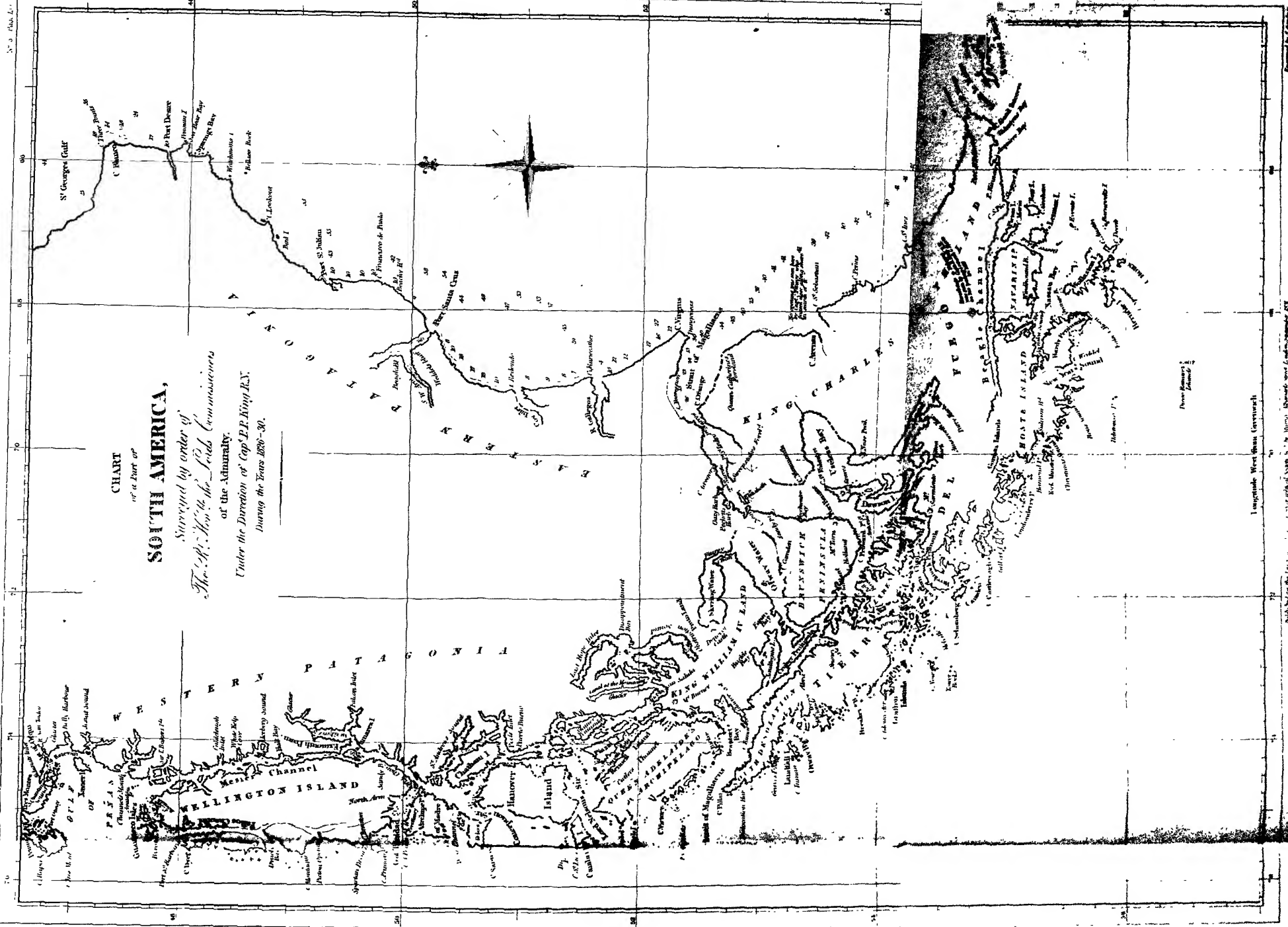
But we cannot fail to be struck by the extraordinary capabilities of the soil; from the foot of Atlas to the shores of the Atlantic, one vast corn plain. Give but direction to the waters, which are not wanting, and abundance would speedily follow. It is mortifying to see such blessings spurned by a bigoted and fanatic government—land covered with weeds that might give food to millions.

Surely some effort should be made to open a trade with this country; the consumption of a population of five or six millions, even though they be Moors and Arabs, must be of importance to

CHART
of a Part of
SOUTH AMERICA,

*Surveyed by order of
The Capt. Wm. M. Phelps, Commissioner
of the Admiralty.*

*Under the Direction of Cap. P. P. King, R.N.
During the Years 1826-30.*



Longitude West from Greenwich

European nations, but especially to a country so essentially commercial as Great Britain.

A few words must be said of the map. Travelling along the coast of the Atlantic from Cape Spartel to Cape Blanco, a distance of two hundred and fifty miles, generally within one mile of the sea, and often along the beach, a sailor's attention would naturally be directed to endeavour to fix the line of the coast, to effect which no opportunity was lost; not less than one hundred bearings were taken, solely for the purpose of fixing points and headlands accurately, and which were invariably transferred to paper before going to bed. The rough track contained in fourteen sheets, on the scale of half an inch to a mile, will exemplify this. These sheets have been connected, corrected by astronomical observations, and reduced to a small scale. The windings of the river *Seboo* are from a sketch of Colonel Harding, R.E., who accompanied a mission to *Fās* in 1825. The points of the northern coast from *Tolúño* and the Admiralty charts; for the south-western parts of the coast obligations are due to the liberality and kindness of Captain Beaufort, hydrographer, for allowing the use of the late Captain Boteler's observations. With such help there is no hesitation in asserting that the present is by far the most correct map hitherto completed of the empire of Morocco.

XI.—*Some Observations upon the Geography of the Southern Extremity of South America, Tierra del Fuego, and the Strait of Magulhaens*; made during the late Survey of those coasts in his Majesty's ships *Adventure* and *Beagle*, between the years 1826 and 1830. By Captain Phillip Parker King, F.R.S., &c., and Commander of the Expedition. Read 25th April and 9th May, 1831.

CONSIDERING the vast extent of sea-coast that comprises the southern part of this continent, it is not a little surprising that it should have been so frequently passed by during the last century without having been more visited and explored. Within the last eight or ten years, however, it has been very much resorted to by English and American vessels in the seal trade, and to the observing portion of their enterprising crews many of its intricacies are well known; but as the knowledge they have derived from their experience has only in one instance, that of Mr. Weddel's voyage, been published to the world, our charts cannot be said to have been much improved for the last fifty years.

The eastern coast of Patagonia, by which name the country

between the River Plate and the Strait of Magalhaens* is known, as well as the north-eastern side of *Tierra del Fuego*, were coasted by Malespina; and the charts resulting therefrom not only vie with any contemporaneous production for accuracy and detail, but are even now quite sufficient for the general purposes of navigation.

The Strait of Magalhaens has been explored by several navigators; but, among the numerous plans of it that are extant, those of Sir John Narborough and Cordova are the most correct. The first is particularly noticed in the late Admiral Burney's very useful work, and the result of the last has been published in the Spanish language, and is entitled '*Ultimo Viage al Estrecho de Magallanes.*' A second voyage was also made by Cordova to the Strait, the proceedings of which form an appendix to the above work. It is furnished with a good general chart of the coast, another of the Strait, and many plans of the anchorages within it. Byron, Wallis, Carteret, and Bougainville had already made considerable additions to Narborough's plan, from which a chart had been compiled that answered all the purposes of general geographical information, and might even have been sufficient for its navigation: for the latter purpose, however, Cordova's chart was much superior, but being published in Spain only, and its existence little known in England, I found great difficulty in procuring a copy before I sailed for my own use.

The southern coast of *Tierra del Fuego* between Cape Good Success, the southern limit of the Strait le Maire, and Cape Pillar at the Strait of Magalhaens's western end, were very little known. Captain Cook's voyage affords several useful notices of the coast between Cape Deseado and Christmas Sound, and the Dutch fleet under Hermite partially explored the neighbourhood of Cape Horn: a confused chart of this coast, however, was the best that could be put together; and although Weddel has more recently published a good account of the harbours and anchorages near Cape Horn and New Year's Sound, yet little available benefit was derived from it, because these different navigators having confined their examinations to small portions of the coast, it was difficult to connect their respective plans, even on so small a scale as that of the general chart.

The western coast of South America, which is very intricate, extending from Cape Victory (the north-west entrance of the

* There has existed much difference of opinion as to the correct mode of spelling this name. The French and English usually write it Magellan, and the Spaniards Magallanes; but by the Portuguese, and he was a native of Portugal, it is universally written Magalhaes. Admiral Burney and Mr. Dalrymple spell it Magalhanes, which mode I have elsewhere adopted, but I have convinced myself of the propriety of following the Portuguese orthography for a name which to this day is very common both in Portugal and Brazil.

Strait of Magalhaens) to the island of Chiloe, may be said to have been wholly unknown ; for since the time of Sarmiento de Gamboa nothing but the brief notices of two missionary voyages in piraguas, from Chiloe to the Guiateca and Guaianeco islands, had been published in the least descriptive of it.

Every person conversant with South American geography must be acquainted with the voyage of Sarmiento. From the determined perseverance through difficulties of no ordinary nature shown by this excellent and skilful navigator, we are possessed of the details of a voyage down the western coast and through the Strait of Magalhaens that has never been surpassed. His journal has furnished us with the description of a coast more difficult and dangerous to explore than any that could readily be selected ; for it was at that time perfectly unknown, and is exposed to a climate of perpetual storms and rain : yet the account is written with such minute care and correctness, that we have been enabled to detect upon our charts almost every place that is described in the Gulf of Trinidad, and the channels to the south of it, particularly their termination at his *Ancon sin Salida*.

It would be irrelevant to enter here into the history of Sarmiento's voyage, or indeed of any other connected with the coasts I am about to describe. Modern surveys are made so much more in detail than what was formerly practised or considered necessary, that little use can be derived from the charts and plans that have been hitherto formed ; but the accounts of the voyages connected with them are replete with interesting and useful matter, and much amusement as well as information may be derived from their perusal, particularly Sir John Narborough's journal, and Byron's romantic and pathetic narrative of the loss of the *Wager*.

The Cordillera of the Andes, which is known to extend from the northern part of the continent almost to its southern extremity without a break, gradually decreases in elevation as it reaches the higher southern latitudes. In the neighbourhood of Quito, Chimborazo, and Pinchincha rear their summits to the height nearly of twenty-two thousand feet above the level of the sea : near Santiago de Chile the highest land is fourteen thousand feet ; farther south, at Concepcion, it is still lower ; and at Chiloe there are few parts of the range exceeding six thousand feet. Between Chiloe and the Strait of Magalhaens the average height may be taken at three thousand feet ; but there are some mountains which may be between five and six thousand feet high.

By a reference to the chart it will be seen that about the parallel of 40° the coast begins to assume, and retains to its furthest extremity, a very different appearance from that which it exhibits to the northward, where the sea, which is kept at a distance from the Cordillera by a belt of comparatively low land for continuous

intervals of some hundred miles, washes a long unbroken shore, affording neither shelter for vessels nor landing for boats; but to the southward of that parallel its waters reach to the very base of the great chain of the Andes, and, flowing as it were into the deep ravines that wind through its ramifications, form numerous channels, sounds, gulfs, and, in many instances, insulate large portions of land. In fact the whole of this space is fronted by large islands and extensive archipelagos, of which the most conspicuous are the great island of Chiloe, Wellington Island, the Archipelago of Madre de Dios, Hanover Island, and Queen Adelaide's Archipelago. The last forms the western entrance of the strait on its north side. The land of Tres Montes, however, is an exception: it is a peninsula, and is the only part of the continent within their above limits that is exposed to the ocean's swell. It forms the northern part of the Gulf of Penas, and is joined to the main by the narrow isthmus of Ofqui, over which the Indians, in travelling along the coast, carry their canoes to avoid the risk of passing round the peninsula, a route of extreme danger. It was here that Byron and his shipwrecked companions crossed over with their Indian guides; but it is a route that is not much frequented; for this part of the coast is very thinly inhabited, and the trouble of pulling to pieces and reconstructing their canoes*, an operation absolutely necessary for them to adopt from the difficulty of the ascent and descent of the mountain over which they must pass, so great, that I imagine it is only performed on occasions of great importance. In this way the piraguas which conveyed the missionary voyagers to the Guaianeco islands were transported over the isthmus; the particulars of which are fully detailed in their journals †.

The river San Tadeo, although of small size, being navigable only for eleven miles, is the largest of any of the rivers of the coast to the south of the Archipelago of Chiloe, and therefore merits a particular description. At seven miles from the mouth it is fed by two streams or torrents, the currents of which are so strong that a fast-pulling boat can hardly make way against it. One of these streams takes its rise in a mountainous range over which it is probable the communicating road passes; and the other is the drain of an extensive glacier or plain of ice of fifteen miles in extent. The river falls into the Gulf of St. Estevan over a shallow bar upon which there is scarcely two feet water, and at low tide is probably dry.

* During our examination of this part, our boats ascended the river San Tadeo and endeavoured in vain to find any traces of the road: an almost impenetrable jungle of reeds and underwood lined the banks of the river, and time was too valuable to admit of further delay in search of an object comparatively of minor importance.

† Agueros, *Descripción Historial de la Provincia y Archipelago de Chiloe*, 1791. p. 229.

At the head of St. Estevan's Gulf is St. Quentin's Sound; both were examined and found to afford excellent anchorage, and they are both of easy access should a ship, passing up the coast, find herself upon a lee shore and not able to weather the land, as was the case with the ill-fated *Wager**.

The Guaianeco islands form the southern head of the Gulf of Peñas; then follows Wellington Island, separated from the main by the Mesier Channel, which had not been previously explored, its mouth only being laid down in the charts compiled from the information of Machado, a pilot who was sent in 1769 by the viceroy of Peru to examine the coast from Chiloe to the Strait of Magalhaens†. This channel is also noticed in one of the two missionary voyages above mentioned; but the object of these expeditions being for the purpose of converting the Indians to Christianity‡, and not for the extension of geographical knowledge, little information of that nature could be obtained from their journal: the entrance of the Mesier, however, is described by them; and on one occasion they were obliged to take refuge in it for fifteen days§. With this exception I cannot find that it has ever been entered before our visit.

The length of the channel is one hundred and sixty miles, and it joins the Concepcion Strait behind the Madre de Dios archipelago, at the Brazo Ancho of Sarmiento. Lieutenant Skyring, who superintended this particular part of the survey, called the land which it insulates, Wellington Island; the seaward coast of which, bearing on the old chart the name of Campaña, is probably fringed by one or more islands. Fallos Channel, which separates the Campaña and Wellington Islands, was examined, from its northern entrance, for thirty-three miles, and was conjectured, after communicating with the sea at Dynely Sound, to extend to the southward, and fall into the Gulf of Trinidad by one of the deep sounds which were noticed on the north shore.

About thirty miles within the Mesier Channel, from the northern extremity, the west side appears to be formed by a succession of large islands, many of which are separated by wide channels lead-

* The precise situation of the wreck of this vessel had hitherto been very vaguely marked on our charts: a careful perusal, however, of Byron's narrative, and of Agueros's account of the Missionary Voyages in 1779, sufficiently point out the place within a few miles. It is on the north side, near the west end of the easternmost of the Guaianeco islands, which we named in consequence *Wager Island*. At Port Santa Barbara, seventeen miles to the southward of this group, a very old worm-eaten beam of a vessel was found, which there is reason to think may be a relic of that unfortunate ship. It was of English oak, and was found thrown up above the high-water mark upon the rocks at the entrance of the port. No other vestige was detected by us;—the missionaries, however, found broken glass bottles and other evident traces of the wreck. At Chiloe I saw a man who had formed one of this enterprising party, and obtained from him a curious and interesting account of those voyages.

† Agueros, p. 205, et seq.

‡ Ibid. p. 181, et seq.

§ Ibid. p. 237.

ing to the south-west, and probably communicating with the Fallos Channel. On the eastern shore the openings were found to be either narrow inlets or abruptly terminating sounds.

On both sides of the channel the coast is hilly, but not very high, and in many places there is much low and generally thickly wooded land. This character distinguishes the Mesier from all other channels.

The trees here are nearly of the same description as those which are found in all parts between Cape Tres Montes and the Strait of Magalhaens. Of these the most common are an evergreen beech (*Fagus betuloides*), a birch-like beech (*Fagus antarctica*), the Winter's bark (*Winterana aromatica* *), and a tree with all the appearance and habit of a cypress, of which the Indians make their spears; and among others there is one, the wood of which being extremely hard and weighty, answers better than the rest for fuel; the sealers call it 'the red wood,' from its colour. From the great quantity of timber which grows here it would be naturally supposed probable that spars for masts could be easily obtained, or at least woods useful for less important purposes; but, although many trees were found that were sufficiently large at the base, they grew to no great height; and, in consequence of the moisture of the climate, and the crowded state of the forests preventing the admission of the sun's rays, the wood generally proved to be decayed in the heart; besides being very subject, even after a long seasoning, to warp and split when exposed to a dry air.

Ten miles beyond White-Kelp Cove, which is fifty miles within the entrance, the character of the Mesier Channel changes entirely; the shore on either side being formed of mountainous and precipitous ridges rising abruptly from the water. After this, at Halt Bay, twenty-three miles beyond White-Kelp Cove, the channel narrows for a considerable distance, and in three particular places is not more than four hundred yards wide. This part of the channel is called in the chart the English Narrows. It is long and intricate, with many islands strewed throughout; and preserves its tortuous and frequently narrow course to its junction with the 'Wide Channel,' in which the breadth increases to two miles and a half; and then, running thirty-four miles with a direct and unimpeded course, falls into the Concepcion Strait as above stated.

At the point where the Mesier and the Wide Channels unite, a deep sound extends to the N.N.E. for forty-six miles. It was named Sir George Eyre's Sound. An extensive glacier sloping into the sea from the summit of a range of high snowy mountains, that are visible from many parts of the Mesier Channel, terminates

* Living plants of the above trees, and other vegetable productions from the Strait of Magalhaens, were introduced into England upon the return of the expedition, and have since thriven exceedingly well.

this sound ; and near the head of it several large icebergs, containing no inconsiderable blocks of granite, were found aground.*

Of the archipelago of Madre de Dios we know very little. It has probably many deep openings on its seaward face, and is fronted by islands and rocks. Its character is rocky and mountainous, and by no means agreeable. The wide and safe channel of Concepcion Strait separates it from the main land, which in this part is much intersected by deep sounds, the principal of which, the Canal of St. Andrew, extends to the base of the snowy range of the Cordillera, and there Lieutenant Skyring describes it to be ' suddenly and boldly closed by tremendous and astonishing glaciers.'

Sarmiento's ' Puerto Bueno' was found to be, as the name describes it, an excellent harbour. The depth of water all over is not more than nine fathoms, an advantage which few harbours hereabout possess : a ship is in perfect security in any part, but this is the only peculiar advantage the port offers ; for wood and water are equally abundant ; fish are as easily to be caught ; and the steamer or racehorse duck, geese, wild ducks, and other smaller birds, are as numerous in all other places. But of any other useful productions, or good soil, the country is quite destitute ; ' for if,' says Lieutenant Skyring, ' we force a passage through the woods, it is over fallen trees and moss ; if we walk over open, flat ground, we find the place a swamp ; and if we climb the hills, we travel over a continuous rock, generally covered by a spongy moss, and entirely destitute of soil of any description.'

Behind Hanover Island, which is separated from Madre de Dios by the Concepcion Strait, the main is very much intersected by extensive sounds trending deeply into the land, like the St. Andrew Channel, to the base of the Andes.

South of Hanover Island is Queen Adelaide's Archipelago, through which are several channels that communicate with the Strait of Magalhaens ; of which the principal, Smyth's Channel, falls into the Strait at Cape Tamar.

Of the whole of the outer or sea-coast, from the Guaianeco Islands to the Strait, we know little, our operations having been confined to the exploration of the interior channels and sounds, the examination of which is even yet far from being complete.

In the winter of 1829, my colleague, Captain Robert Fitzroy, the commander of the *Beagle*, in examining the Jerome Channel,

* Near Falcon Inlet, seven miles up the eastern side of Sir George Eyre's Sound, are some large ' rookeries,' or breeding-haunts, of fur-seal. Many thousands of these animals were congregated together, which had been probably driven from the sea-coast by the activity of the seal-fishers ; and perhaps, for many years, if not ages, have been breeding undisturbed in this hitherto unknown, and therefore safe and quiet recess. Two seals that were killed appeared to be of the same description as the species which frequents the sea-coasts.

which communicates with the Strait in that part called Crooked Reach, discovered 'Otway Water,' a large inland sea fifty miles long, trending to the N. E., and separated from the eastern entrance of the Strait by a narrow isthmus; the actual width of which was not ascertained, for in the attempt the boats were nearly lost. The south-eastern shore is high and rocky, and generally precipitous, but the northern is formed by low undulating grassy plains, free from trees, and precisely like the country about the entrance of the Strait. At the north-west corner of the water, Captain Fitzroy found the mouth of a channel which carried him in a north-west direction for twelve miles, when it opened into another inland salt-water lake, about thirty-four miles long and twenty wide. This was called the Skyring Water. The southern and western sides of the water are bounded by mountainous land, but the northern shore is low, apparently formed of undulating downs and grassy plains, and in some places watered by rivulets. At the western extremity of the water, Captain Fitzroy observed two openings, separated by a remarkable castellated mountain which he called Dynevor Castle. Beyond the southernmost opening there was no land visible, not even a distant mountain, which induced Captain Fitzroy to suppose that it was a channel communicating with the western coast; but from what we now know, it is not probable that it can lead to anything of consequence. It is perhaps backed by low marshy land reaching to the hills at the bottom of Glacier Bay, which, from the distance being seventy miles, were not visible above the horizon. The northern opening probably winds under Dynevor Castle, and perhaps very nearly reaches the bottom of Obstruction Sound. The Skyring Water was not further explored; partly from want of a sufficient quantity of provisions to undertake it with any prospect of succeeding, and partly from a strong south-westerly gale, from which there was no shelter for the open boats in which this examination was performed. The remainder, therefore, of Captain Fitzroy's time was spent in perfecting what he had commenced; and, after an absence of thirty-two days, he rejoined his ship at Port Gallant.

At the western end of the Fitzroy Channel, which unites the waters, the shore is well clothed on the north side with luxuriant grass and trefoil, with here and there a sprinkling of brushwood, but is entirely destitute of trees. The soil, although dry, is light and tolerably good; but the ground is perforated everywhere by some burrowing animal, probably skunks, or *caviás*. The tracks of horses were noticed in many places, and the bones of guanacoës were scattered about. Water was not very plentiful, but several small brooks and springs in the sides of the hills were observed, sufficient for all useful purposes.

On the south side of the channel the land is low but wooded:

the banks are from five to forty feet high, sloping to the water, and covered with grass. In the entrance the tide ran five or six knots at the neaps, but inside with only half that rapidity. On the north side, at the distance of a mile and a half, there is a ridge of hills, at the summit of which Captain Fitzroy made an excursion, which he thus describes :

‘ Our way led through a scattered wood, the only one I saw on the north bank of the channel. Most of the trees appeared to have been either burned or blown down by the wind, and then blackened by decay. We reached the foot of the hills at eleven o’clock, having commenced our journey at eight, and attained the summit at twelve o’clock, whence the view we obtained amply repaid us for our trouble. It is a central spot, and, although not more than six hundred feet above the level of the sea, offers as extensive a view as any spot near it. We could see the hills near Cape Gregory, the Sweepstakes Foreland, Elizabeth Island, Cape Monmouth, the high peaks near Cape Froward, and the range of mountains between it and Jerome Channel, some of the mountainous land between Capes Phillip and Parker, and the whole extent of the Otway and Skyring waters. The latter seemed to be bounded to the north-east by down-like hills, about three or four hundred feet high. To the north of the station extends a range of similar downs, and to the east a succession of lagoons completely intersect the flat country between it and Peckett’s Harbour. No opening was observed in the eastern side of Otway Water, and the neck of land separating it from the strait near Elizabeth Island, did not seem to be more than three or four miles wide.’

In consequence of the supposed communication of the Skyring Water with some part of the western coast, a careful examination was made of every opening trending into the interior behind the islands and archipelagos that line the western coast ; the result of which has proved that the hypothesis so naturally formed by Captain Fitzroy was not confirmed by fact. A reference to the chart will show how carefully the search was carried on, and with what want of success it was concluded. The deep opening discovered by Sarmiento, and named by him ‘ *Ancon sin salida*,’ was found upon examination to extend so far into the interior, and in the direction of the Skyring Water, that the most minute investigation of the numerous sounds and canals was made in the perfect conviction of finding the desired communication. But after a patient, laborious, and minute investigation, particularly of those openings which led to the southward, among which Obstruction Sound held the most flattering appearance, Lieutenant Skyring, who performed this service, was obliged to give up the search and return. At one part, near the south-eastern end of the sound, he

entered an opening which at first had an appearance that was favourable to the desired communication, but it terminated in low woody land. There was, however, a wooded hill near the shore, which he ascended with the hope of obtaining a view of the country; but the sides and summit of the hill were so thickly clothed as to obstruct his view, and with the exception of some distant high land in the south-east quarter, and a sheet of water about six miles off in the same bearing, nothing was discerned to repay him for the fatigue and trouble of the ascent. Whether the water is a lagoon, or a part of the Skyring Water, or whether it communicates with the opening trending round the north side of Dynevor Castle, remains yet to be ascertained.

After being foiled in this attempt, Lieutenant Skyring proceeded onward in a S.S.W. direction, and after a pull of ten miles came to the bottom of the sound. It was terminated by high precipitous land encircling every part. 'Throughout the examination of 'this sound,' he writes, 'we never distinguished any strength of 'tide, and the rise and fall never appeared to have exceeded a 'foot; that there was a slight ebb and flow was evident from the 'streams of foam which extended from the water courses, and 'also from the fallen leaves borne off the shore of the bays in long 'lines; but signs like these, I believe, will be considered indicative of there being no strength of tide. I have frequently noticed 'such appearances in large ports and inlets, but never in any 'channel.' Neither wigwams, nor traces of Indians, were seen in this sound, another proof, were one required, of the sound not communicating with the Skyring Water; for the Indians very rarely visit these deep inlets, but are always to be found in narrow straits or communicating channels, where, from the strength of the tide, seals and porpoises, which constitute the principal food of the Fuegian Indians, abound. Sarmiento's name, therefore, of 'Ancon sin salida' (a cove or inlet without a thoroughfare), a name, which we had hoped to have expunged from the chart, must now remain a lasting memorial of his enterprising character, and of a voyage deservedly one of the most celebrated as well as most useful of the age in which it was performed.

The termination of Obstruction Sound is one of the most remarkable features in the geography of this part of South America.

In this examination the southern extremity of the Cordillera was ascertained. The eastern shores of the interior channels were found to be low plains, with no hills nor mountains visible in the distance, and such being the feature also of the northern shores of the Otway and Skyring Waters, it is probable that all the country to the east of the sounds is a continued *pampa* or plain.

Recent traces of Indians were seen in some places, but at the time our party was there they were either absent or had concealed

themselves. I should not think that these interior sounds are much frequented by them ; a family was, however, met in the Fitzroy Channel (which separates the Otway from the Skyring), clothed with guanaco skins, like the Patagonian tribes, but in manners and disposition resembling the wandering inhabitants of the Strait and Tierra del Fuego ; and they had canoes, which the Patagonians do not use. They had probably come thus far for the purpose of communicating with the latter tribes, with whom they frequently have friendly intercourse. No guanacoës were seen either on the shores of the inland waters or of the sounds within the 'Ancon sin salida,' although the country, being open and covered with luxuriant grass, was peculiarly suited to their habits ; but as several large herds of deer were observed feeding near the sea-shore of Obstruction Sound, and the neighbouring country, the presence of these latter animals may probably be the cause ; for on the eastern coast, where the guanacoës are everywhere abundant, the deer do not make their appearance. Sea-otters were the only other animals that we met with, and they were only occasionally noticed swimming about the kelp. The shores of the sounds were in many places crowded with the black-necked swan (*Anas nigricollis*, Linn.), and there were a few seen, but only one captured, whose plumage, excepting the tips of the wings, which were black, was of a dazzling white colour. I have described it in the first part of the Proceedings of the Zoological Society as a new species (*Cygnus anatoïdes*.)

The Strait of Magalhaens, being a transverse section of the continent, exhibits a very good view of its geological structure. The strait may be divided into three portions ; the western, central, and the eastern. The western end and centre are of primitive character, rugged and very mountainous ; whilst the eastern portion is of recent formation and low. The western tract is composed of a succession of stratified rocks, a difference at once distinguishable by the form and nature of the ranges, and the direction of the shores ; the hills are irregularly heaped together ; the sounds are intricate and tortuous in their course, and the shores are formed by deep sinuosities and prominently projecting headlands : the channels, also, are studded with innumerable islands and rocks, extremely dangerous for navigation. In this portion the rock is, for the most part, granite and greenstone.

Near the centre of the Strait, the rock being clay-slate, the mountains are higher, and more precipitous and rugged in their outline ; and consequently not easily to be ascended. They are in general three thousand feet, but some are found to be four thousand feet in height ; and one, Mount Sarmiento, is upwards of six thousand feet high, and is covered throughout the year with snow. The line of perpetual snow in the Strait seems to be about

three thousand five hundred or four thousand feet above the sea; for the mountains, whose height does not exceed three thousand, are, during the summer, frequently free from any, excepting in holes, where a large quantity is accumulated by drifting, and protected from the sun. The strait here is quite free from islands, and it is a remarkable fact, that, where the greenstone formation terminates, there the islands cease to appear.

The slate formation continues as far as Freshwater Bay, where the stratified rocks leave the coast and extend backwards in a north-west direction. The soil then becomes apparently a mixture of decomposed slate and clay; the slate gradually disappearing on approaching to Cape Negro, where the rock partakes of the character of the east coast. Here again we observe, along with the change of geological character, the reappearance of islands, the soil of which is clayey, but with masses of granite, hornblende rock and clay slate protruding in many places through the superficial soil, which, although it yields a poor grass, is entirely destitute of trees.

In that portion of the Strait to the eastward of Cape Negro the hills are remarkable for the regularity and parallelism of their direction, and their general resemblance to each other. On the north shore, near Cape Gregory, a range of hills commences suddenly, with rather a precipitous ascent, and extends for forty miles to the north-east, where it terminates in detached rocky hills. The south-western end of the range is a ridge of flat-topped land covered with soil, but with here and there a protruding mass of primitive rock; one of these appeared to be of sienite or granite. The north-eastern end of this range is perhaps more bare of soil, and, therefore, exposes the rock, which shows itself in detached hills. Precisely similar in appearance and direction is a range on the south shore, about fifty miles in length, commencing at Cape Monmouth and terminating in detached hills in the vicinity of the south side of the First Narrow. The courses, also, of both the First and Second Narrows, which are just within the eastern entrance of the strait, are nearly parallel with these hills; and the smaller ranges of eminences, Elizabeth Island and the cliffy land of Cape Negro, where the clay formation commences, all trend to the N.N.E., preserving a general resemblance of form and character to the two ranges above-mentioned.

The irregularity of the topographic features of the more western portion of the Strait, combined with its confused assemblage and immense number of islands and rocks—the regularity of the strata,—the coinciding parallelism of all the bays, channels, and sounds,—and the total absence of islands in the central portion or slate formation, together with the remarkable similarity of the direction of the hills and coast line, and the stratification of the north-

eastern tract, which is very different from that of the centre,—are very striking facts, and, geologically considered, are of great interest.

No less remarkable, however, and equally interesting, is the character of the vegetation; not so much in the variety of plants, as in their stunted growth to the westward, their luxuriance in the centre, and the total absence of trees to the eastward. For this modification the following reasons seem to me to account sufficiently:—to the westward the decomposition of granite, and the other primitive rocks which are found there, forms but a poor, unproductive soil; so that, although the land is thickly covered with shrubs, they are all small and stunted: the torrents of water also that pour down the steep sides of the hills, wash away the partial accumulations of soil that are occasionally deposited; consequently, few trees are to be found, excepting in clefts and recesses of the rock, where decomposed vegetable matter collects and nourishes their growth; but even there they are low and stunted, for the most luxuriant seldom attain a larger diameter than nine or ten inches.

From the regularity of the direction of the strata in the slate districts the valleys are very extensive, and, being bounded on either side by precipitous mountains much intersected by deep ravines, receive large streams of water, which, uniting together in their course to the sea, form no inconsiderable rivers. During the winter months these rivers become swollen and overflow their banks, and deposit a quantity of alluvium, which, blending with the fallen leaves and other putrescent substances, produces a good superficial soil, in which trees grow to a large size, and the shrubs and smaller plants become particularly luxuriant and productive.

At Port Famine, and in its neighbourhood, the evergreen beech (*Fagus betuloides*) grows in the greatest abundance, and reaches a very large size. Trees of this species, of three feet in diameter, are abundant; of four feet there are many; and there is one tree (perhaps the very same noticed by Commodore Byron*), which measures seven feet in diameter for seventeen feet above the roots, and then divides into three large branches, each of which is three feet through. This venerable tree seemed to be sound, but from our experience of several others that were cut down, might be expected to prove rotten in the centre. This tendency to decaying in the heart may be attributed to the coldness of the schistose sub-soil upon which the trees are rooted, as well as to the perpetual moisture of the climate above alluded to.

The slate formation ceases at Port St. Mary, but there is no decided change in the vegetation until we come to Cape Negro, where the clay commences; and from thence onwards there is not a tree to be found. The nature of the soil is not favourable to

* Hawkesworth, Voyages, i. 36.

plants which take a deep root, and, therefore, only shrubs and grasses are found: the former are thinly scattered over the extensive plains which characterize this country; but the grasses are abundant, and although of a harsh and dry appearance, must be nourishing, for they form the chosen food of numerous and large herds of guanacoës.

Besides the evergreen beech above-mentioned, there are but few other trees in the Strait that can be considered as timber trees. Such an appellation only belongs to two other species of beech and the Winter's bark. The last, which is also an evergreen, is to be found mixed with the first, in all parts of the Strait; so that the country and hills from the height of two thousand feet above the sea, to the very verge of the high-water mark, are covered with a perpetual verdure which is remarkably striking, particularly in those places where the glaciers descend into the sea; the sudden contrast in such cases presenting to the view a scene as agreeable as it seems to be anomalous. I have myself seen vegetation thriving most luxuriantly, and large woody-stemmed trees of *Fuchsia* and *Veronica**, in England considered and treated as tender plants, in full flower, within a very short distance of the base of a mountain, covered for two-thirds down with snow, and with the temperature at 36°. The *Fuchsia* certainly was rarely found but in sheltered spots, but not so the *Veronica*; for the beaches of the bays on the west side of St. John's Island at Port San Antonio are lined with trees of the latter, growing even in the very wash of the sea. There is no part of the Strait more exposed to the wind than this, for it faces the reach to the west of Cape Froward, down which the wind constantly blows, and brings with it a succession of rain, sleet, or snow; and in the winter months, from April to August, the ground is covered with a layer of snow, from six inches to two or three feet in depth.

There must be, therefore, some peculiar quality in the atmosphere of this otherwise rigorous climate which favours vegetation; for if not, these comparatively delicate plants could not live and flourish through the long and severe winters of this region.

In the summer, the temperature at night was frequently as low as 29° of Fahrenheit, and yet I never noticed the following morning any blight or injury sustained by these plants, even in the slightest degree.

One circumstance, however, deserves to be mentioned, which may in some measure account for the innocuous effect of so low a temperature. I have occasionally, during the summer, been up the greater part of the night at my observatory, with the internal as well as the external thermometers as low as freezing point.

* The stems of both from six to seven inches in diameter.

without being particularly warmly clad, and yet not feeling the least cold; and in the winter, the thermometer, on similar occasions, has been at 24° and 26° , without my suffering the slightest inconvenience. This I attributed at the time to the peculiar stillness of the air, although, within a short distance in the offing and overhead, the wind was high.

Whilst upon this subject, there are two facts which may be mentioned as illustrative of the mildness of the climate, notwithstanding the lowness of the temperature. One is the comparative warmth of the sea near its surface, between which and the air, I have, in the month of June, the middle of the winter season, observed a difference of 30° , upon which occasion the sea was covered with a cloud of steam. The other is, that parrots and humming-birds, generally the inhabitants of warm regions, are very numerous in the southern and western parts of the Strait—the former feeding upon the seeds of the Winter's bark, and the latter have been seen by us chirping and sipping the sweets of the *Fuchsia* and other flowers, after two or three days of constant rain, snow, and sleet, during which the thermometer has been at freezing point. We saw them also in the month of May upon the wing, during a snow shower; and they are found in all parts of the south-west and west coasts as far as Valparaiso. I have since been informed that this species is also an inhabitant of Peru; so that it has a range of more than 41° of latitude, the southern limit being $53\frac{1}{2}^{\circ}$ south*.

Tierra del Fuego is divided into three large islands by two channels; one of which is opposite to Cape Froward, and the other fronts Port Gallant. The easternmost, Magdalen Sound, trends in a due south direction for nineteen miles, and separates the clay slate from the more crystalline rocks which seem to predominate in Clarence Island, and are chiefly of greenstone; though, at the eastern end, there is much mica slate. At the bottom of Magdalen Sound the channel turns sharply to the westward; and after a course of about forty miles, meets the Barbara Channel, which, as above-mentioned, communicates with the Strait opposite to Port Gallant, and both fall into the sea together. Magdalen Sound and its continuation, Cockburn Channel, are almost quite free from islands and rocks; but the Barbara Channel, which separates the granite from the greenstone and mica slate districts, is throughout thickly strewed with islands, which reduce

* This bird, although not rare in several English collections, had never been noticed until I forwarded it to England in the early part of the year 1827, when my friend Mr. Vigors described it in the *Zoological Journal* for the month of November, 1827, (vol. iii. p. 432,) under the name of *Melospiza Knapu*. Shortly afterwards, M. Lesson published it in his *Manuel d'Ornithologie*, (vol. ii. p. 80,) as *Ornospiza xphanoides*, as a discovery belonging to the Coquille's voyage, in the illustrations of which it is figured at plate 31.

the channel in some places to a mile, and in one place to not more than fifty yards in width. Here, of course, the tide sets with great strength. Several vessels, however, have passed through it under sail; and one ship, (a whaler belonging to Messrs. Enderbys,) working through the Strait, and finding much difficulty in passing to the westward, bore up, and, the wind being fair and the distance to sea only fifty miles, ran through it without accident. The land to the westward of the Barbara Channel is high and rugged; and although in the vallies, ravines and sheltered nooks there is no want of vegetation, yet, in comparison with the eastern part of the Strait, it has a very dismal and uninviting appearance. It was called by Sarmiento, 'Santa Ines Island *;' but Narborough called it, very appropriately, 'South Desolation, it being,' as he says, 'so desolate land to behold †.'

Clarence Island, the extent of which is fifty-two miles long and twenty-three broad, although equally rocky, is much more verdant in appearance. The uniform direction of the headlands of the north shore of this island is remarkable. Upon taking a set of angles with the theodolite placed upon the extremity of the west end of Bell Bay, opposite to Cape Holland, the most prominent points to the south-east, as far as could be seen, were all visible in the field of the telescope at the same bearing. The same thing occurred on the opposite shore of the Strait, where the projections of Cape Gallant, Cape Holland, and Cape Froward, are in the same line of bearing; so that a parallel ruler placed on the map upon the projecting points of the south shore, extended across, will also touch the headlands of the opposite coast.

The eastern island, which had been previously called, and of course retains on our charts the name of *King Charles's South Land*, extends from the entrance of the Strait to the outlet of the Barbara and Cockburn Channels, at Cape Schomberg. The northern part partakes of the geological character of the eastern portion of the Strait. The centre is a continuation of the slate formation, which is evident at a glance, from the uniformity of the direction of the shores of Admiralty Sound, the Gabriel Channel, and all the bays and mountain ranges of Dawson's Island. The south shore, or seaward coast line, is principally of greenstone, excepting the shores of the Beagle Channel, which extends from Christmas Sound to Cape San Pio, a distance of a hundred and twenty miles, with a course so direct that no points of the opposite shores cross and intercept a free view through; although its average breadth, which also is very parallel, is not more than a mile, and in some places only a third of a mile across. The south shores of Hoste and Navarin Islands are of hornblende rock, which is also the principal component of the islands in the neighbour-

* Sarmiento, p. 180.

† Narborough's Voyage, p. 78.

hood, as well as of the island itself of Cape Horn. The eastern part of King Charles's South Land is low, with plains like the Patagonian coast; but the range of high land crossing the Strait at Port Famine extends down the north side of Admiralty Sound, and, perhaps with some few interruptions, continues to the south-east extremity of the land, at Cape Good Success, which is the south cape of the west side of Strait Le Maire, and there terminates in lofty mountains covered with snow, one of which, called in the charts 'The Sugar-loaf,' is probably four thousand feet high.

The eastern shore of King Charles's South Land, towards the south part, is lofty, but near the northern part is very low. The interior is also low, with extensive plains, abounding with guana-coes, some of which were shot by the officers of the *Beagle* within fifty miles of Cape Horn.

In the year 1828, from the commencement of January to the middle of August, the *Adventure* (the ship I commanded) was at anchor at Port Famine, in the strait of Magalhaens, in latitude $53^{\circ} 38\frac{1}{4}'$ south, and longitude $70^{\circ} 54'$ west of Greenwich; and during the whole of that time a careful meteorological journal was kept. The temperature was registered from a very good thermometer of Fahrenheit's scale, suspended within a copper cylindrical case of nine inches diameter, and perforated above and below with holes, to admit a free current of air. The cylinder was fixed to the roof of a shed, thatched with dried leaves to shelter it from the sun, while the sides were open. The barometer (a mountain barometer made by Newman, with an iron cylinder) was hung up in the observatory, five feet above the high-water mark, and both instruments were examined carefully and regularly at the following hours, viz.: six and nine o'clock in the morning, at noon, and at three and six o'clock in the evening. The state of the atmosphere was observed daily, by Daniel's hygrometer, at three o'clock in the afternoon. The maximum and minimum temperatures were also observed twice in twenty-four hours, from a Six's thermometer, viz.: at nine o'clock in the morning, and at nine in the evening. From this journal the following abstract has been drawn up:—

SUMMARY OF METEOROLOGICAL OBSERVATIONS.

TABLE I.

Mean height of the BAROMETER, corrected for Neutl. Pt. and Capill., and reduced to the temperature of 32°.

Hour.	AUTUMNAL PERIOD.			BRUMAL PERIOD.			12 Days of August	MEANS		
	Feb	March.	April	May.	June.	July.		Autum.	Brumal	Au. & Br
	Inches.	inches	inches.	inches.	inches	inches.	Inches.	inches.	inches.	inches.
VI.	29·404	29·631	29·569	+29·322	+29·279	29·581	29·230	29·531	+29·394	29·463
IX.	+·415	+·655	+·581	·311	·277	+·584	·257	+·550	·391	+·470
XII.	·405	-·641	·574	·292	·272	·576	·308	·540	·380	·460
III.	-·399	·647	-·555	-·285	-·271	-·542	·318	-·534	-·366	-·450
VI.	·404	·657	·579	·308	·294	·571	·318	·540	·391	·465
Means	29·405	29·646	29·572	29·304	29·279	29·571	29·286	29·539	29·384	29·462

TABLE II.

THERMOMETER—Fahrenheit.

Hour.	AUTUMNAL PERIOD			BRUMAL PERIOD.			12 Days of August	MEANS.		
	Feb	March.	April.	May	June.	July		Autum.	Brumal.	Au & Br
	°	°	°	°	°	°	°	°	°	°
VI.	44·30	44·20	35·82	34·74	30·67	30·53	33·46	41·44	31·98	36·71
IX.	51·33	49·87	40·61	36·36	31·83	31·50	35·11	47·29	33·23	40·26
XII.	54·23	52·53	45·42	40·68	36·02	35·93	37·92	50·73	37·54	44·13
III.	54·44	52·39	44·88	39·62	34·36	34·59	36·24	50·57	36·19	43·38
VI.	51·16	47·84	39·83	35·97	31·98	32·58	33·54	46·13	33·51	39·82
Means	51·10	49·37	41·22	35·47	32·97	33·03	33·25	47·23	34·49	40·86

TABLE III.

DANIEL'S HYGROMETER, observed at 3 P.M., daily, and compared with the mean temperature.											
	AUTUMNAL PERIOD.			BRUMAL PERIOD.			12 Days of August	MEANS.			
	Feb.	March.	April.	May.	June.	July.		Autum.	Brumal.	Au. & Br	
Monthly mean tem. from Table II. }	51.10	49.37	41.22	35.47	32.97	33.03	33.25	47.23	34.49	40.86	
Temperature of dew point }	41.31	40.75	34.83	34.88	30.28	29.41	30.28	38.96	31.52	35.24	
Difference between mean temper. and dew point }	9.79	8.62	6.39	0.59	2.69	3.62	2.97	8.27	2.30	5.28	
Dryness (the point of Saturation being 1000) }	711.8	736.42	809.9	980.6	903.8	876.3	894.6	752.71	920.23	836.47	
Elasticity of vapour	295.7	289.0	238.64	239.04	202.24	196.46	202.2	274.44	212.58	243.51	
Weight of a cubic foot of vapour in grains	3.3441	3.2801	2.7550	2.7926	2.3731	2.3048	2.3421	3.1264	2.4902	2.8053	

TABLE IV.

Months.	Pressure.			Temperature.									Dew Point, Hygrometer.		
				Air			Water.								
	Max.	Min.	Range.	Max	Min	Range.	Max.	Min	Range				Max.	Min	Range
	inches	inches.	inches.	°	°	°	°	°	°				°	°	°
February	30.087	28.768	1.319	66	28	38.0	52.5	43.7	8.8	51.2	31	20.2			
March	30.099	29.004	1.095	68	30.5	37.5	50.5	41.5	9.0	47	35	12			
April	30.055	28.844	1.211	57.5	28	29.5	47.8	40.5	7.3	42	27	15			
May	29.850	28.795	1.055	49.5	20.5	29.0	48.2	42.8	5.4	43	21	22			
June	30.079	28.274	1.805	48.7	19.2	29.5	47.0	40.3	6.7	41.5	20	21.5			
July	30.500	28.942	1.558	44.2	12.6	31.6	45.0	41.8	3.2	39.7	19	20.7			
August } 12 days	29.782	28.709	1.073	49.2	18.5	30.7	43.1	40.2	2.9	37.2	20.5	16.7			

From the preceding tables it will be seen that the mean temperature for the autumnal period (the months of February, March, and April) was 47°2; the maximum and minimum were respectively 68° and 28°. For the brumal period, the three following months, the mean temperature was 34°5, and the maximum and minimum 49°5 and 12°6. During the former, or autumnal period, the barometer ranged between 30.099 and 28.768 inches, and for the latter it was between 30.5 and 28.274

inches. The range for the first being 1.331 inches, and for the last 2.226 inches.

The eastern coast of Patagonia, from the entrance of the Strait of Magalhaens to the River Plate, is comparatively low. From Cape Virgins to Port St. Julian, where porphyritic clay-stone commences, the coast is formed of clay cliffs, horizontally stratified, and the country is undulating, with extensive plains, or *pampas*, covered with grass, but without trees. At Port St. Julian the country becomes hilly, and continues so, as far to the northward as latitude 44° , the rock being porphyritic. The clay formation to the southward has been likened to the appearance of the coast of Kent, and, at a short distance, it bears, certainly, a very great resemblance to it; but the cliffs, instead of being of chalk, are composed of a soft marly clay, without any gravel or impressions of organic remains, excepting at Port St. Julian, where fossil shells, both bivalves and univalves, are found imbedded in clay cliffs; and, on the surface, are lying, strewed about, large oyster shells.

In the clay formation there are three rivers; the Gallegos in latitude $51^{\circ} 38'$; Port Santa Cruz in latitude $50^{\circ} 7'$, and in $49^{\circ} 12'$ is Port San Julian. The first does not extend further into the interior than forty miles from the coast, and to about the same distance Port Santa Cruz penetrates; but Port San Julian is of much smaller size, and Coy Inlet, in latitude $50^{\circ} 58'$, can only be entered by boats. The Gallegos, at high water, may be easily entered, but, at low water, the banks are dry to a great extent; a channel, however, is left on its south side of sufficient depth for a small vessel; the tide rises here forty-six feet, and the stream is very strong. At Santa Cruz and Port San Julian the tides are neither so strong, nor do they rise and fall so much as at the Gallegos.

Port Desire, about thirty miles to the southward of Cape Blanco, the mouth being in $47^{\circ} 45'$ south latitude, has a narrow entrance with strong tides; but affords in the offing very good anchorage as well as shelter from the prevailing winds, which are off shore or westerly. The river extends up the country nearly in a due-west direction for eighteen miles, but the land is dry and parched, and very unsuitable for the establishment which the Spanish government formed there not many years since, and of which evident traces remain to this day.

St. George's Gulf, called, in the old charts, 'Bahia sin Fondo,' or Deep-Sea Gulf, was formerly considered to be a deep sinuosity of the coast into which a river emptied its waters after winding through a large tract of country; for, until the Descubieta and Atrevidas voyage of discovery, very vague accounts had been given of this or indeed of any other part of the coast. The Gulf, upon

that examination, was found to possess no river or creek in any part excepting on the north side, where there are several deep bays and coves which are and have been frequented by our sealing vessels. Its northern head is called Cape Two Bays; and, thirty miles to the northward, is Port St. Helena, which is the northern limit of our examination of the eastern coast. The country about is dry and parched, although thickly covered with small shrubs and a tolerable grass, on which large herds of guanacoës feed.

According to Falconer, (the Jesuit missionary who resided many years among the Indian tribes inhabiting the country about Buenos Ayres,) the eastern coast between the latitudes of 41° and 51° is frequented by the natives, for the purpose only of burying the dead: they have, however, been occasionally met with travelling along the coast, apparently without any particular object in view. Near Port Desire I have seen the graves of the Indians on the summit of the hills, but the bodies had been removed, probably by the Indians themselves; for we are informed by Falconer, that, after the dead have been interred twelve months, the graves are visited by the tribe, for the purpose of collecting the bones and conveying them to their family sepulchres, where they are set up and adorned with all the beads and ornaments the friends and family of the deceased can collect for the occasion. The ceremony is performed by certain women of the tribe, whose peculiar office it is to attend to these rites.

VII.—*General Remarks on the coast of Arracan*; transmitted by Captain Laws, H.M.S. *Satellite*; communicated by Captain Beaufort, F.R.S. Read 13th June, 1831.

THE HARBOURS, PRODUCE OF THE COUNTRY, NATIVES, &c.

THE province of Arracan extends from the left bank of the Tiknaaf river, in latitude $20^{\circ} 46'$ N., and longitude $92^{\circ} 20'$ E., to Cape Negrais, in latitude $16^{\circ} 2'$ N., and longitude $94^{\circ} 14'$ E., and is divided from the Burman territory by the Yeomandong mountains, lying parallel to, and in some places approaching very near, the sea-coast, which is fronted by numerous islands, moderately high and thinly inhabited, the largest of which are Cheduba and Ramree, forming part of a group which were almost unknown to Europeans before the Burmese war of 1824. Amongst them are several good harbours, particularly that of Kyouk Phyoo, which takes its name from the small white pebbles that are washed on the beach during the S.W. monsoon, Kyouk Phyoo meaning 'white stones.' Akyab to the northward and Ramree to the southward are also safe harbours, and both have inland water communications with Kyouk Phyoo, as it has with

Mion river, Arracan town (now reduced to a few huts), Jalak, Mai, and Aing, from whence there is a pass over the Yeomandong with a road to Ava, by which one division of the British army returned to Jalak from Melloon after the peace. Sandoway, and even Giva, may also be said to have inland navigation to Kyouk Phyoo, as there is a creek from the latter communicating with Sandoway river.

The comparatively small number of Europeans that has yet resided in the Arracan province, renders it premature to judge of its climate; and though all whom we met spoke favourably of it, it certainly is not free from the diseases common to India. Jalak and Arracan towns have everything in their vicinity to make them unhealthy, being placed in mere swamps, enveloped in thick fogs during the N.E. monsoon, and inundated during the opposite season. Our troops suffered much from dysentery and fever at both during the Burman war; while, on the sea-coast, at Kyouk Phyoo, Sandoway, and Negrais, they were comparatively healthy, those places having a cool sea-breeze with temperate nights nearly throughout the year. But at any distance from the sea, where the land is low, heavy fogs and dews prevail during the nights, with hot days. The S.W. monsoon begins early in May and lasts until the end of October; it usually blows along the coast, except when interrupted (which it frequently is about the full and change of the moon) by strong S. and S.W. winds, accompanied with heavy rain and sea, making it at such time necessary to approach this coast with great caution, as there is no place of shelter between Negrais and Ramree, with numerous dangers between them. From November to April the weather is fine and the water smooth;—an anchorage may then be found, on a muddy bottom, in from six to twenty fathoms, all the way from the Naaf to Negrais, with good landing. The rise of tide appears to be nowhere so great as at Kyouk Phyoo (sixteen feet in the springs). In January and February we experienced little or no current in the offing until to the southward of Cheduba; between it and Negrais it ran south from one to one mile and a half per hour. The islands on their northern and eastern sides are fertile, producing rice in abundance; also cotton, silk, and indigo; but only sufficient is cultivated for the consumption of the very few inhabitants, who are now reduced to little more than 200,000 in the whole province; almost every Burman, with all that was costly or respectable, having recrossed the Yeomandong when the province was ceded to the East India Company, who, with one regiment of sepoys, now hold the scattered remains of its ancient inhabitants (the Mughs) in perfect subjection. It is divided into three districts, Akyab, Ramree, and Sandoway, each governed by a civil judge or superintendent, under the immediate inspection of a com-

missioner, who usually resides at Chittagong. These judges (officers in the Indian army) have a number of Bengalee policemen; and the one at Akyab, which is much the largest district, has two companies of natives to assist in preserving peace and collecting the revenue, which amounts annually, in the whole province, to about three lacs and a half of rupees (350,000*l.*), produced principally by the rental of land, the Company considering themselves the proprietors of the soil. A tax on everything useful or necessary is also imposed to raise this apparently insignificant amount, which barely defrays the expenses, though the garrison only consists of eight companies of sepoys, two of which are stationed at Akyab, two at Sandoway, and the other four with the head-quarters of the regiment at Kyouk Phyoo, where a cantonment has been recently formed, and part of the flotilla employed in the late war, consisting of flats and gunboats, is laid up. The others are at Jergo, or Amherst Island, off the south end of Ramree, where there are temporary storehouses, with a quantity of naval stores, decaying very fast, from want of proper protection from the climate, as also are the boats.

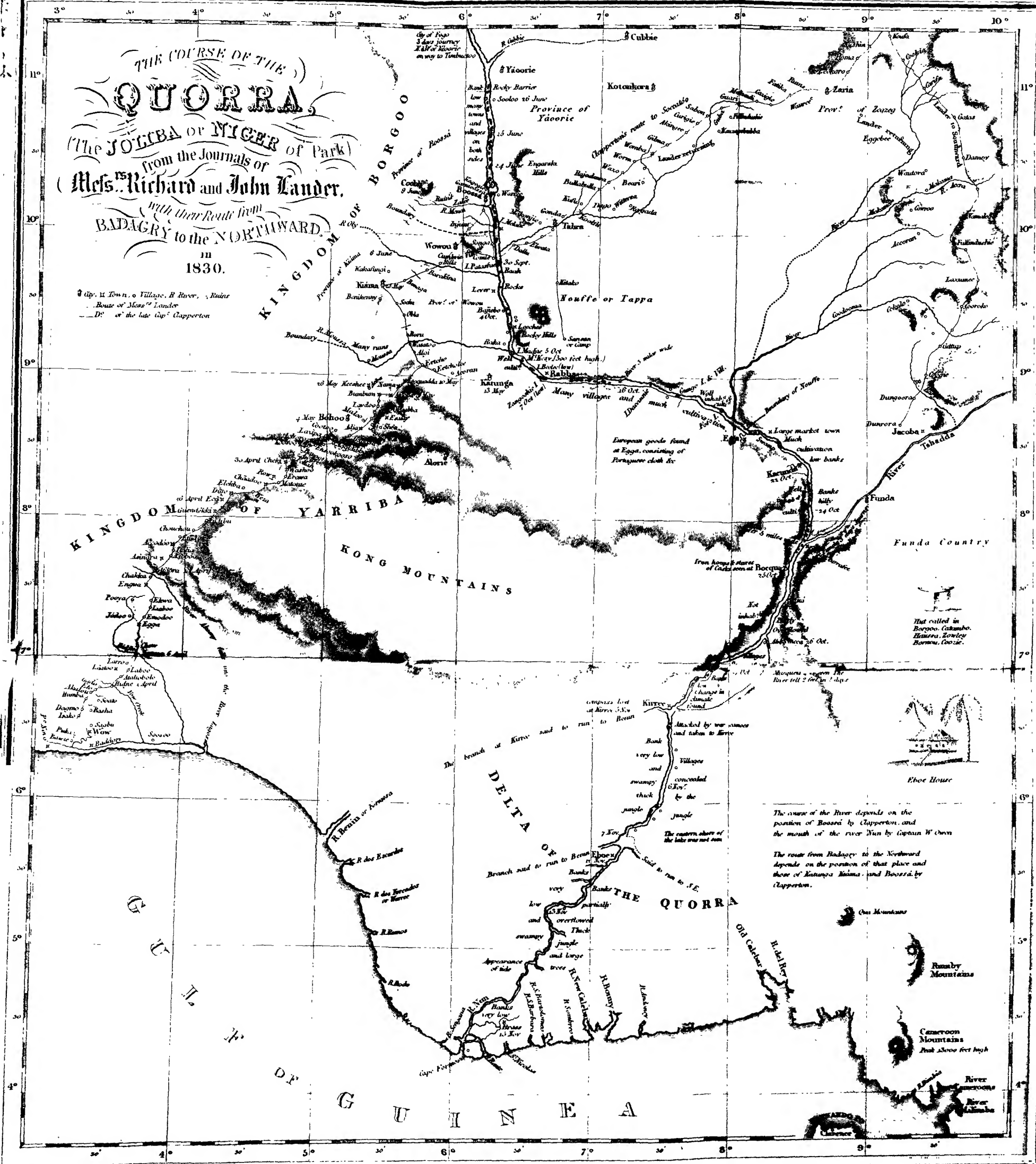
There is a regular *dâk* established between Calcutta and Arracan province, as far as Sandoway, *via* Chittagong, Akyab, Kyouk, Phyoo, and Ramree: it is from nine to ten days reaching Akyab, and is thence conveyed in boats by the inland communications to the southward, usually reaching Sandoway in four days.

The inhabitants are a hardy, inoffensive race; and, having had little intercourse with strangers, supply all their wants from the immediate vicinity of their houses, which are universally bamboo huts, raised upon piles about four feet from the ground, and generally in some thick jungle near the water, with small patches of rice, indigo, cotton, tobacco, and fruit-trees at no very great distance. Fish are abundant, constituting, with rice, their principal food; and this year, for the first time, a cargo of both has been purchased for the Mauritius—the rice at the rate of 1*l.* 8*s.* per ton, and the fish equally low. Poultry is also very numerous at Arracan—eighteen for a rupee; nor is there any scarcity of bullocks or buffaloes. The latter they esteem most, from their being docile and useful in cultivating and treading out rice; and it is difficult to say what other use they make of either, as they neither kill them for food, nor do they use milk or anything made from it, and were much amused at the Europeans and Hindostanees wishing to get it, asking whether they were not afraid of becoming calves. Their religion, that of Buddha, enjoins them not to take away life; but they do not appear very bigoted to this part of their creed, as they had no objection to part with their oxen or buffaloes, and ate any part when dead, even to the offal usually given to dogs. We procured excellent ox-beef, with

an abundance of vegetables, at Cheduba and Ramree, at the rate of three halfpence the pound: at Kyouk Phyoo, it was the same price; but the cantonment having been so recently formed, it was by no means so good, nor were vegetables easily to be procured, though we got a few of the best oranges I have tasted in India, and I was told they were abundant at the latter part of the year.

Though, in many respects, the people are far from being civilized, in others they surpass the most polished nations. There is rarely a person to be met with who cannot read and write; and records are kept on the palm-leaf, beautifully lacquered in japan or red, generally on a gilt ground, with dark letters. Their common accounts are written with a chalk pencil, resembling talc, on folds of paper made from the bark of a tree, and then covered with lamp-black, or a smooth board, besmeared with the same substance. They have thirty-six characters in their alphabet, written from left to right; and they hold their pen or pencil as we do, the lines being as fine, and the characters as beautifully formed, as if made with a pen and ink.

Their priests appear entirely occupied in the education of the children, and in every village there are two or three. Their schools are equally open to all; and the only remuneration appears to be a sufficient quantity of food, and the erection of a house which answers as a residence, temple, and school-room; with generally a small pagoda, having a number of poles and pendants hanging from it, much after the manner represented on the common china-ware. Indeed, all their habits, as well as their persons and dress, resemble those of the western part of China. Celibacy is observed by the priests, who universally shave their heads, and wear a dirty yellow cotton dress; and before any boy can be prepared for admission as a priest, he must publicly declare his own and his parents' free consent. Should he afterwards, however, at any time of his life, repent of his resolution, it is not thought disgraceful for him to say so, and he may return to the common walks of life, and take a wife as soon as he pleases. The only foreigners now in Arracan are the servants of the East India Company, who, both civil and military, spoke of the priests (or pondis, as they are termed) as being an unassuming, well-disposed set of men, never interfering with the concerns of others, unless applied to as arbitrators, when they exercise their judgment with impartiality. The 'Mughs,' in their manners, are perfectly free from the servile hypocrisy of their western neighbours, and equally unlike them as to probity—their words being generally to be taken; and, in dealing with you, they ask the price which they consider the article worth, and no more; though it is to be feared the intercourse which they are likely to have with the natives of Bengal will soon



THE COURSE OF THE
QUORRA
(The JOLIBA or NIGER of Park)
from the Journals of
Messrs. Richard and John Lander.
with their Route from
BADAGRY to the NORTHWARD.
IN
1830.

Cap. a Town, o Village, R River, Ruins
House of Messrs. Lander
D. of the late Cap. Clapperton

The course of the River depends on the position of Bozosa by Clapperton, and the mouth of the river Nun by Captain W. Owen

The route from Badagry to the Northward depends on the position of that place and those of Katsanga, Kaima, and Bozosa by Clapperton.





remove these honest traits in their characters. The women dress much after the Chinese fashion, but are by no means secluded, having a full share in all the common intercourse or transactions in life.

At present, except rice, there seem to be no surplus articles for export, though there is no doubt the country would afford abundance, were its resources brought out, which can only be done by a much larger population than it is likely to have for many years, even under the most favourable government. Their imports are very trifling—a few boats coasting alongshore to Chittagong, and from thence, by the Sunderbunds, to Calcutta, are sufficient for all their trade to the northward; and a not much larger number to Basseen, and from thence through the Sunderbunds of the Irrawaddy to Ava or Rangoon, are required to bring back silk and other articles manufactured in that country, which are much superior to those made by themselves, and more esteemed than any yet brought by Europeans.

XIII.—*Extracts from the Journal of an Expedition undertaken by order of his Majesty's Government, to determine the Course and Termination of the Niger, more properly named Quorra, from Yáoori to the Sea.* By Richard and John Lander. Communicated by Lieutenant Becher, R.N. Read 27th June, 1831.

RICHARD LANDER, who had accompanied the late Captain Clapperton on his second expedition into the interior of Africa, embarked, with his brother John, at Portsmouth, on the 9th of January, 1830, on board the brig *Alert*, and arrived at Cape Coast Castle on the 22d of the following month. From this settlement they were conveyed to Badágyry in his Majesty's sloop *Clinker*; and on the 31st of March they commenced their journey into the interior. The orders they had received from the secretary of state were to make their way overland to Boossà by the former route; thence to proceed to Yáoori; to embark on the river; and, following the stream, not to quit it till they reached its termination. Pursuing a route through the Yarriba country, varying in some parts from that which Captain Clapperton had taken, they reached the city of Kiáma on the 28th of May. In the course of their route, they passed through forests of large trees, morasses, and a wilderness of stunted trees, interrupted at intervals by patches of cultivated land. The approach to Kiáma is thus described:—

‘Our path lay through a rich country covered with luxuriant grasses and fine trees, but very little underwood. It abounds

plentifully with deer and antelopes, and other wild animals of a more ferocious nature, such as the lion, the leopard, the elephant, and the wild ass. We saw no buffaloes, but now and then heard their lowing. On the 28th May, the jingling of bells announced the approach of a body of horsemen, who rapidly galloped up to our hut, and saluted us, one after another, with a martial air, by brandishing their spears within a few feet of us. To display their horsemanship, they caused their steeds to prance and rear; and when they imagined we were convinced of their abilities, they dismounted to prostrate themselves before us, and acquaint us of the welfare of their prince.'

'We continued our journey at noon: the warmth of the weather, and the loads of the horses, obliged us to travel slowly. At five P.M. we reached the ruins of a small town. The path was through the same forest as the preceding day, but less thickly wooded. At one place we remarked two immensely largely trees, springing up almost close together; their mighty trunks and branches twisted and firmly clasped round each other. Ant-hills were numerous in the road, and a few paces from it we observed, as we rode along, little cone-shaped mud buildings, erected by the natives for the purpose of smelting iron ore, which is found in abundance in different parts of the country. After passing Benuikenni, our course still lay through the forest, whose trees, shrubs, and plants spread around a delicious fragrance; and, as night came on, the polished spears and silver-topped caps of our escort, with the luminous firefly, a brilliant firmament of stars, and the bright moon, animated the scene around us, till, at about eight o'clock P.M., we reached Kíáma, and were immediately conducted to the king's residence.'

Proceeding onwards through the city of Wouwou, the two travellers reached Boossà on the 17th June. After passing along some vallies, in which a heavy shower during the night had filled the paths with water, and crossing a magnificent plain, partially wooded with very old and ornamental trees, they descried, at the distance of two or three miles, the city of Boossà, formed of clusters of scattered huts. This city does not stand upon an island, as described by Captain Clapperton, but is on the main land, on the right bank of the river. At ten A.M. they entered the city by the western gateway, and discharged their muskets as the signal of their arrival.

'June 18.—This morning,' says one of the brothers, 'I visited the far-famed Niger, or Quorra, which flows at the foot of the city, about a mile from our residence; and I was greatly surprised at its reduced breadth. Black rugged rocks rose abruptly from the centre of the stream, and its surface was agitated by whirlpools. At this place, in its widest part, (the end of the dry

season,) it was not more than a stone's throw across. The rock on which I sat overlooks the spot where Mr. Park and his associates met their unhappy fate.'

The king afterwards exhibited to the travellers one of Mr. Park's books, which is described as a nautical book containing tables of logarithms.

On the 23d of June they set out from Boossà, for Yáoori. Only one of the branches of the river which meet at Boossà flows by Kagogie, a small village about six miles north of Boossà, yet this of itself is a mile in width; but large sand-banks are in the centre of the stream, and it is so shallow that, except in one very narrow place, a child might wade across it without difficulty.

'June 26.—We had passed the island whereon we had slept last night but a few minutes, and had just entered the main river, when we came to a spot where it spreads again, and each channel was full of dangerous rocks, sand-banks, and low islands covered with tall rank grass. We were conducted up the main channel; but were soon obliged to get out of the canoe to lighten her. During the greater part of the forenoon our canoe was continually striking against concealed rocks, or running on sand-banks, which obliged us to be constantly getting out and in.

'On the 27th of June we arrived at Yáoori. With the exception of the dangerous rocks opposite Boossà, we were informed that, during our four days' passage thence, we had passed almost all the difficult places in the river, there being, as is said, neither rocks nor sand-banks either above Yáoori or below Boossà. We have said nothing of the direction of the river, because it is pretty well understood that this city lies nearly due north of Boossà; and also, that notwithstanding its windings, and the number and variety of its channels among the islands, the Quorra flows past Boossà in a single undivided channel. In its natural bed, when uninterrupted by rocks, the river appears to run at this time of the year (June) between one and two miles an hour: whenever it is obstructed by them, the current is, of course, considerably greater.

'Although, during the dry season, no communication is maintained by water between Boossà and the countries lower down the river, by reason of the dangerous rocks which have been already alluded to, yet, in the wet season, after the "malca" (or fourteen days' incessant rain) has set in, when all the rivers which are dry during the remainder of the year pour their overflowing contents into the "Great Father of Waters," as the Quorra is emphatically styled, these canoes, we were told, pass to and fro between Yáoori, Nyffe, Boossà, and Funda. It is immediately after the malca, also, that the river, by the depth and velocity of its current, sweeps off the rank grass which springs up annually

on its borders. Every rock and every low island are then completely covered, and may be passed over in canoes without difficulty, or even apprehension of danger. Many years ago a large boat arrived at Yáoori, on a trading voyage from Timbuctoo; but when they had disposed of their merchandise, the boatmen returned to their country by land, because they asserted that the exertion of working their vessel back so long a way against the stream was too great for them, and therefore they left it behind at Yáoori. The journey from hence to the city of Soccatoo, when no stoppage is made on the road, may easily be accomplished in five days, and this is the regular time the natives take to go there. Coulofo* is two days' journey from Yáoori.

Yáoori is a large, flourishing kingdom. It is bounded on the east by Haussa, on the west by Burgoo, on the north by Cubbie, and on the south by the kingdom of Nouffie. The crown is hereditary; the government an absolute despotism. The former sultan was deposed by his subjects for his violent measures and general bad conduct; and the present ruler, who has succeeded him, has reigned for the long period of thirty-nine years. The sultan has a strong military force, which, it is said, has successfully repelled the continued attacks of the ever-restless Falatahs: it is now employed in a remote province in quelling an insurrection, occasioned partly by the inability of the natives to pay their accustomed tribute, and partly from the harsh measures adopted by the sultan to compel them to do so. The city of Yáoori is of great extent, and very populous. It is surrounded by a high and strong wall of clay, and may be between twenty and thirty miles in circuit. It has eight large entrance gates or doors, which are well fortified after the manner of the country. The inhabitants manufacture a very coarse and inferior sort of gunpowder, which, however, is the best, and we believe the only thing of the kind made in this part of the country: they also make very neat saddles, cloth, &c. &c. They grow indigo, tobacco, onions, wheat, and other varieties of corn and rice of a superior quality, and have horses, bullocks, sheep, and goats; but, notwithstanding their industry, and the advantages which they enjoy, they are very poorly clad, have little money, and are perpetually complaining of the badness of the times. A market is held in the city daily, under commodious sheds; yet it is but indifferently attended, and the articles which are exposed for sale have been already mentioned.'

'*July 29.*—At this time Yáoori is little better than one complete swamp; and, if possible, it will be worse after the malca shall have set in, which is daily looked for.'

'*August 2.*—On leaving the city, it was literally covered with water, and the deep hollows formed by the rains were very nu-

* A town passed through by Clapperton after crossing the Quorra.

merous, and also dangerous, from being invisible. Owing to the reputed badness of the path by which we had entered Yáoori, it was rejected for a more northerly one, leading, in almost a direct line, to the river Cubbie, on which we embarked to return to Boossá. On entering the Quorra from this river, it was found running at the rate of two or three miles an hour. The banks of the river on the way down to Boossà, as well as its islands, were covered in many places with vast quantities of corn, which grows to the height of ten or twelve feet. The people on both sides are mostly of the Cumbrie race, who are poor, despised, and abused, but industrious and hard-working; in fact, they are considered as slaves by their more powerful neighbours. The river we found much swollen, its current much more impetuous than when we came up to it from Boossà, and many of the shoals and rocks which then annoyed us, were now under water, and completely hidden.

‘*Sept. 20.*—This day we left Boossà on our voyage down the river. Having taken leave of the old king and queen, on our way towards the river we found our path lined with people, some of whom saluted us on one knee, some on both, and we received their benedictions as we walked along. We embarked at noon. At a small island called Melalie, at which we were obliged to stop to repair our canoe, the current was running three or four miles an hour, and the bed of the river was full of rocks, some of which were shooting up within a few inches of the surface, which occasioned the water to make a loud rushing noise. Owing to the skillfulness of our pilot, we succeeded in crossing one or two reefs, which, in the dry season more especially, must be highly perilous; even as it was, we experienced considerable difficulty in getting over them. At two o’clock we passed the boundaries of Boossà, and entered the dominions of the King of Nouffie. At night we stopped at a large island, called Patáshie. The banks of the river near this place appear fertile and well inhabited: the river was much swollen by the rains, and in some places almost on a level with its banks. Patáshie is about a mile in width, and several miles in length. Opposite the town of Lèver (also called Layaba), the river becomes very narrow and deep. This town has an extensive population of Nouffie people.

‘After leaving Layaba, we ran down the stream for twelve or fourteen miles, the Quorra, during the whole distance, rolling grandly along—a noble river, neither obstructed by islands, nor deformed with rocks and stones. Its width varied from one to three miles, the country on each side very flat, and a few mean, dirty-looking villages scattered on the water’s edge. Just below the town of Bajiebo the river is divided by an island. At this town, which we left on the 5th of October, for the first time, we

met with very large canoes having a hut in the middle, which contained merchants and their whole families. At the island of Madjie, where we were obliged to stop for canoe-men, we found trees of hungry growth and stunted shrubs, whose foliage seemed for the most part dull and withering: they shoot out of the hollows and interstices of rocks, and hang over immense precipices, whose jagged summits they partly conceal; they are only accessible to wild beasts and birds of prey. The river below Madjie takes a turn to the east by the side of another range of hills, and afterwards flows for a number of miles a little to the southward of east. On leaving the island, we journeyed very rapidly down the current for a few minutes, when, having passed another, we came suddenly in sight of an elevated rocky hill, called Mount Kēsey by the natives. This small island, apparently not less than 300 feet in height, and very steep, is an object of superstitious veneration amongst the natives.

‘The island of Zegozhee*, which we reached on the 7th of October, is opposite to Rabba, and so low, that the houses and trees appeared to be springing from the water. Rabba, which is two miles from this island, appears to be a large, populous, and flourishing town: it is built on the slope of a gentle hill, almost entirely destitute of trees. The Quorra, both yesterday and to-day, has flowed in a direction to the south of east. Rabba market is very celebrated, and considered by traders as one of the largest and best in the whole country, of which it may be styled the emporium. A variety of articles, both of native and foreign manufacture, are sold there; and it is generally well supplied with slaves of both sexes. Yesterday one of our men counted between 100 and 200 men, women, and children, exposed for sale in ranks. These poor creatures have for the most part been captured in war; and it is said the Falatahs rarely treat them with unkindness, and never with brutality. The price of a healthy, strong lad is about 40,000 cowries (8*l.* sterling); a girl fetches as much as 50,000, and perhaps more, if she be at all good-looking; and the value of men and women varies according to their age and abilities. Slaves are sometimes purchased at Rabba by people inhabiting a country situated a good way down the Quorra; and from thence they are delivered from hand to hand, till they at length reach the sea. Ivory is also sold here, and large tusks may be had at 1000 cowries each, and sometimes cheaper. We had eleven elephants’ tusks of our own, which were presented to us by the Kings of Wouwou and Boossà, but we were unable to dispose of them at Rabba, because no strangers were then in the city.

‘On leaving Rabba, we made no stop down the river all day,

* The *zh* is pronounced like *z* in the word *azure*.

not even at meal-times, our men suffering the canoe to pass down the stream, whilst they were eating their food. At five in the afternoon they all complained of fatigue, and we looked around us for a landing-place, but could find none. Every village which we saw was behind large thick morasses and bogs, through which, after various provoking and tedious trials, we found it impossible to penetrate; we were therefore compelled to continue our course on the river. The day had been excessively warm; but, as we saw signs of an approaching storm, we endeavoured to land. This was impossible, in consequence of the swampy banks; and we were buffeted about during the whole night, in imminent danger from the water, and also from the herds or shoals of hippopotami which came snorting about the boat.'

'At ten A.M. on the 17th of October, we passed several mountains of singular and picturesque appearance, which are situated a few miles beyond the borders of the river to our left, and shortly after we came in sight of other mountains yet more interesting and romantic; but these were very elevated, and so far a-head of us, that they could hardly be distinguished from faint blue clouds. At the island of Gungo, which we had passed, the natives were in their canoes, and leaving it, in consequence of their village being overflowed, so high was the water of the river. At the island of Tofó, where we stopped on the 18th October, we found the cocoa-nut (not the tree, but the fruit) for the first time since leaving the Yarriba country. On the 19th we observed and passed a river of considerable size, which entered the Quorra from the north-west.' (This was the Coodoonia, which Richard Lander had crossed on his former return journey from Soccatoo; and it may be observed, as a remarkable instance of the accuracy of the present and former route, that the coincidence falls within a mile or two.) 'Very elevated land appeared on each side of the Quorra as far as could be seen.'

'Egga, the next town we came to, is upwards of two miles in length, and we were struck with the immense number of bulky canoes which lay off it, filled with trading commodities, and all kinds of merchandize common to the country. The course of the river was here about E.S.E. Benin and Portuguese clothes are worn at Egga by many of its inhabitants; so that it would appear some kind of communication is kept up between this place and the sea-coast. The people are very speculative and enterprising, and numbers of them employ all their time solely in trading up and down the river. They live entirely in their canoes, over which they have a shed, which answers completely every purpose for which it is intended; so that, in their constant peregrinations, they have no need of any other dwelling or shelter than that which their canoes afford them.

Cocoa-nuts are sold about the streets in great quantities, and various little parcels of them were sent to us; but we understood that they are imported from a neighbouring country. Egga is of prodigious extent, and has an immense population. Like many other towns on the banks of the river, it is not unfrequently inundated, and a large portion of it was at that time actually overflowed. The soil in the vicinity of the town consists of a dark heavy mould, uncommonly productive; so that, with trifling labour, all the necessaries of life are obtained in plenty, and cheaply. The inhabitants eat little animal food, but live principally on fish, which are sold at a reasonable rate. Hyænas are said to abound in the woods in great numbers, and are so bold and rapacious as to have lately carried away nearly the whole of the sheep in the town. Near this place is a considerable market-town on the opposite side of the river. A few miles below Egga the dominion of the chiefs or kings of territories is no longer acknowledged, and each town or city has its own ruler.'

'Oct. 25.—At five in the morning we found ourselves nearly opposite a very considerable river entering the Quorra from the eastward. We first supposed it to be an arm of the river running from us; but the strong opposing current soon proved our mistake. We had now many hills to our right and left, close to the banks; others at a greater distance. At seven o'clock the river seemed free of islands and morasses, and its banks were well wooded, and much higher than we had observed them for a long time previously, nevertheless it ran over a rocky bottom, which caused its surface to ripple exceedingly. At ten A.M. we passed a huge and naked white rock, in the form of a perfect dome, arising from the centre of the river, which we named the Bird Rock, from its being covered with them. The course of the river this morning was S.S.W.; and its width varied, as usual, from two to five or six miles.'

'At Bocqua, 26th Oct., we were informed that directly opposite to it, on the eastern bank, is the common path to the city of Funda, which is situated three days' journey inland from the Quorra; that the large river we observed yesterday falling into the Quorra from the eastward is the celebrated Shar, Shary, or Sharry, of travellers; or, as it is more commonly called than either, the Tshadda; indeed, it is universally so called throughout the country. The interpreter further said, that the small river we had passed on the 19th, flowing from the same direction, is the Coodoonia.'

'At Bocqua some iron hoops were found, and staves of casks. Bocqua possesses four markets. The chief of Bocqua told us to avoid his enemy, the chief of Attà, and that in seven days we should reach the sea. Both banks of the river below Bocqua

still continued hilly and well wooded. At eleven A.M. we were opposite a town, which, from the description that had been given of it, we supposed to be Attà. It was situated close to the water's edge, in an elevated situation, and on a fine green sward, and its appearance was highly beautiful. The town appeared clean, of great extent, and surrounded with fine trees and shrubs. A few canoes were lying at the foot of the town; but we escaped observation, and passed on. Afterwards, the margin of the river became more thickly wooded than before; and, for upwards of thirty miles, not a town or a village, or even a single hut, could any where be seen. The whole of this distance our canoe passed smoothly along the river: everything was silent and solitary; no sound could be distinguished, save our own voices and the splashing of the paddles, with their echoes. The song of birds was not heard, nor could any animal whatever be seen; the banks seemed to be entirely deserted, and the magnificent Quorra to be slumbering in its own grandeur.

'At noon to-day we passed the end of the high hills which had commenced above Bocqua. They were also at some distance from the banks of the river, and changed their direction to the S.S.E. The course of the river this day was nearly S.W., and the breadth varied from three to five miles.

'Oct. 27.—At Abbazacca, about forty-five miles below the junction of the Tshadda with the Quorra, and the first town to the southward of the mountains, on the left bank, we saw an English bar of iron; and, for the first time since leaving Jenna, in Yarriba, we beheld the graceful cocoa-nut tree, and heard the mellow whistling of grey parrots. The chief wished to know from whence we had come; and having told him we came from Yáoori, a great city on the banks of the river, he expressed surprise, never before having heard of the name. The banks between Attà and this place are low, and in some parts inundated. No towns or villages are to be seen on them for many miles, particularly on the western bank. Below Abbazacca, villages are seen every three or four miles on the eastern bank, but little cultivation. At Damuggoo, the natives have European muskets of English manufacture: the king had six small swivels. The natives are expert in the use of fire-arms, and shoot buffaloes, which, however, are not very numerous. The Quorra fell two feet in as many days, but was still overflowing the town. Here we saw a man dressed in a soldier's jacket, and others partially clothed in European apparel, all of whom have picked up a smattering of English from the Liverpool palm-oil vessels in the Bonney river. Bonney is said to be four or five days' journey from hence.

'Oct. 30.—A great part of the population of Damuggoo left the town this morning for the Bocqua market: they take thither

powder, muskets, soap, Manchester cottons, and other articles of European manufacture, and great quantities of rum, or rather rum and water; for not more than one-third of it is genuine spirit, and even that is of the worst quality. These are exchanged for ivory and slaves, which are again sold to the European traders.'

Near Kirree a disaster befell the travellers on the morning of the 5th November, at a place about forty miles farther down the river, the details of which do not come within the purpose of the present memoir. It will be sufficient to observe that they were attacked by large parties in war canoes, some of which had forty paddles, containing fifty or sixty men. Their canoe was run down, and many of their effects lost.

Kirree is a large town and slave mart, frequented by people from the Eboe country for slaves and palm oil. Eboe is said to be three days' journey down the river. A small stream runs into the Quorra from the eastward, opposite to Kirree; but it is not improbable that it may be merely the re-union of a branch which runs off at Damuggoo. At Kirree, also, a considerable branch of the Quorra turns off to the westward, which is said to run to Benin. Being now on the great delta of the river, a change in the climate had been experienced at a short distance above Kirree. The nights were very cold, with heavy dews, and a considerable quantity of dense vapour covered the face of the country in the morning. The banks of the river were cultivated in some places where they were high, but in most places they were low, and the few villages that were seen were nearly concealed by thick jungle. Below Kirree the river is not so serpentine as above it; the banks are so low and regular that not even a simple rising can anywhere be distinguished: they are assuming a degree of sameness little different from that which prevails on many parts of the sea-coast, in the bight of Benin; and here, for the first time, the fibrous mangrove was seen, interspersed amongst the other trees of the forest. Both banks, however, are pretty thickly inhabited, and there are many scattered villages, which, though encompassed with trees, and invisible from the river, could easily be distinguished by the number of their inhabitants appearing on the beach to trade with the canoe-men.

'Nov. 8.—Having embarked long before sunrise, a fog prevented our progress; and from fear of mistaking our way, it was agreed we should return to the land. In pursuance of this plan, we hung on by the shore till the gloom had dispersed, when we found ourselves on an immense body of water like a lake, having gone a little out of the bed of the main stream; and we were at the mouth of a very considerable river flowing out of the lake to the westward, being evidently an important branch of the Quorra. Another branch also ran hence to the S.E. whilst

our course was in a south-westerly direction, on what we considered to be the main body,—the whole forming, in fact, three rivers of no small magnitude. We wished to be more particular in our observations of this interesting part of our journey, but were compelled to forego this gratification on account of the superstitious prejudices of the natives, who affected to be displeased with the attention with which we regarded the river. The opposite shores of the lake were not seen from our position, nor was the branch which runs to the S.E. Several small rivers are also said to fall in on its N.E. shore. Eboe is a large straggling town, one mile W. from the river. The branch of the river on which we had now to proceed is narrower than above the lake, and at its issue from the lake is not more than two miles wide. The banks in many parts are low, swampy, and thickly wooded. At Eboe, which we reached on the 12th November by a shallow canal, we found many large canoes from the coast, with palm-oil puncheons in them, housed over, and each containing about fifty or sixty persons.'

'Nov. 12.—At seven in the morning we left Eboe. King Boy and his wife also embarked. Our canoe, which was heavily laden, was paddled by thirty-eight men and two steersmen—one in the bow and the other in the stern. We had three captains with speaking-trumpets to give orders, one drummer, the king's steward, and his lady's waiting-maid, a cook, and two fellows for baling the boat. At seven A.M. we started; the captains calling out with all their might, through their speaking-trumpets, to their *fetish*, for a prosperous journey. We soon glided along, at a great rate, passing towns and villages at every two or three miles, and more cultivated land than we had seen for fifteen days past. It contained large plantations of yams, bananas, plantains, Indian corn, but no rice; nor did we see any kind of grain after leaving Kacunda, although the soil on the banks of this river would grow all kinds well. The river was not very wide, and narrowed fast: the widest part I do not think was more than two miles, and the narrowest not quite half a mile. At three P.M., its beauty was mostly gone. In many places it had overflowed its banks, through trees and thick underwood, and in the widest part was not more than a mile and a half across. Saw a small branch running off to the west.'

'Nov. 14, 7 P.M.—We turned out of the main river, and proceeded up a small branch, towards Brass Town, which runs in a S.E. by E. direction from the main river. Our course this day was due south, and the river continued to run in the same direction when we left it, overflowing its banks, but much diminished in volume. In the widest part it was not more than half a mile across, and the narrowest about 300 yards. As usual, we

passed many towns and villages during the day, and where the banks were not overflown they were cultivated.

‘ At half-past eight P.M. we found ourselves influenced by the tide, and at every ten or twenty miles we were either on a bank or stuck fast in the underwood ; so that the men, as on former occasions, were obliged to get out and lift the canoe over. Our track was through avenues of mangroves : in many places the trees were arched over so thickly, that we could see no light through them. We continued on, winding in and out, through small creeks, until nine A.M. on the 15th, when we met three large canoes. In one of them was the old King Fourday, and several *fetish* priests ; in another were the brothers of King Boy, and in the third those of Mr. Gun. They had been to the town of Brass, and had brought old King Fourday and the *fetish* priests to escort us into their country. A short time after our arrival at Brass we made fast to the trees, when the tide ebbed, and left us high and dry on black mud half an hour after.’

‘ After leaving Eboe we passed two small branches running to the west, and also two running in the east. The country through which the river winds is low, without a rising ground for many miles. The banks are for the most part swampy : where they are at all habitable, villages are seen, with patches of cultivated ground. On the 13th we passed a village on the right bank, where the stillness of the water and much white foam we imagined to be the effects of the tide. This place is about seventy or eighty miles from the sea. Near the mouth of the river, and in our way up to Brass Town, the banks were so much overflown, that the trees appeared to be growing out of the water.’

The course of the Quorra is combined with the course of the Niger on a reduced scale, and it is due to the Society to offer a few remarks on the method which has been adopted in tracing it. The only instrument possessed by the travellers was the mariner’s compass, and even this was lost at Kirree, which is placed about 180 miles in a direct line from the mouth of the river ; therefore, in the absence of all means of ascertaining, with any pretensions to certainty, a single geographical point, the position of Boossà, and that of the mouth of the river Nun, lying nearly at the two extremes of the whole journey, were adopted as limits within which the course of the river navigation between these places must necessarily fall. The daily progress of the travellers in course and distance, according to their own estimation, was then subjected to rigorous scrutiny ; and the probable distance supposed to have been travelled each day, in which allowance was made for the rate

of the stream (never exceeding three miles, and decreasing downwards), was adopted and laid down on a large scale. This was next reduced into the five sheets that accompany the present paper, which, when joined together as they are marked, show the general course of the river, with such remarks from the journals relating to its banks as occurred during its construction. The materials, thus brought together, underwent a further reduction, on being copied in the general map, between the points before-mentioned ; and it is with some satisfaction, even after the necessarily rough manner in which the whole has been put together, that the following particulars may be pointed out as throwing a degree of probability on the course now laid down being nearly that of the Quorra, which was scarcely to have been expected. The mouth of the river Nun in the map is nearly due south of Boosà, and the course of the river to the east is about the same as that to the west, which corresponds with that condition. The river Coodoonia falls into the Quorra nearly in the same place as before laid down. The great Tshadda was also found to enter the Quorra at about the point before reported. And with respect to Yáoori it may be added, that Soccatoo was said to be five days' journey from it ; while the distance from the former as laid down by Lander, to the latter as given by Clapperton, is about 100 miles, which nearly corresponds with a journey of five days.

ANALYSES,

&c.

I.—*Analysis of a Narrative of a Voyage to the Pacific and Beering's Strait, to co-operate with the Polar Expeditions; performed in his Majesty's Ship Blossom, under the Command of Captain F. W. Beechey, R.N., F.R.S., &c., in the years 1825, 26, 27, and 28. By W. Ainsworth, Esq.*

HIS Majesty's ship Blossom was sent out by his Majesty's government, with a special commission to prosecute researches on the practicability of a north-west passage, and being destined for a long voyage, through seas of different characters, and in very opposite climates, was consequently more fitted up with a view of administering to the necessities and comforts of the officers and men, and providing for the safety of the vessel, than prepared for the slow and lengthened labours of science, or the nicety of observation and experiment.

The instructions, however, given to Captain Beechey by the Board of Admiralty, in addition to the co-operation to be given to the polar expedition, directed him to make geographical observations, of much interest, on the doubtful existence of some islands in the South Pacific, to survey the group of the Society Islands, to direct his course to the Navigators' Islands, and to afford every assistance to the naturalist of the expedition in making collections illustrative of his branch of research.

The additions made to our knowledge of the South Pacific and other seas, with their coasts and islands, by this expedition, will be best given in the shape of a succinct narrative, or an analysis of Captain Beechey's published work; and we shall afterwards give a general idea of the results of the observations and experiments made during the voyage, which, from their variety, number, and exactness, reflect the greatest credit on the science, industry, and perseverance of Captain Beechey, and the officers under his command.

On the 19th of May, 1825, the vessel weighed from Spithead, steering out of the Channel with a fair wind. On the 30th of the

same month, it was ascertained that a reef of rocks, named the Eight Stones, did not exist in the situation which for a number of years they have occupied in our charts. From Cape Finisterre to Point Naga the error in the direction S. 33° W. was not less than ninety miles. The position of the island of Fernanda Noronha was found, on the 26th of June, to be eighteen miles eastward of the position given in the East India Directory.

On the 11th of July they arrived at Rio Janeiro, where they remained until the 13th of August, on which day they sailed for the Pacific. During their stay they measured the height of the Peak of Corcovado, a mass of granite overlooking the placid waters of Bota-Fogo; and after checking these by observations repeated three years afterwards, the height, by trigonometrical measurement, was found to be 2306 feet in the first instance, and 2305½ in the second. In making Cape Horn, on September 16, a current drifted the ship fifty miles to the northward in the twenty-four hours. On the 26th of September they were fifty leagues west of Cape Pillar*. With regard to this navigation, Captain Beechey says, in his nautical remarks appended to the narrative, 'I concur in opinion with Cook, Perouse, Krusenstern, and others, in thinking there is no necessity whatever for going far to the southward: and I should recommend always standing on that tack which gained most longitude, without paying any regard to latitude further than taking care to keep south (say a degree) of Cape Horn.'

On the 6th of October they made the island of Mocha, on the coast of Chili. This island, once celebrated as a resort of the buccaneers, and thickly peopled, was found deserted by Captain Strong in 1690, and appears to have remained uninhabited ever since. On the 8th of the same month they anchored at Talcahuana.

In the survey of the Bay of Concepcion, a shoal was discovered by Lieutenant Belcher on the Penco side. It was also necessary to make some alterations in the position of the Belen Bank, from the manner in which it is laid down in the Spanish charts; and the shoal said to occur off the sandy point of Quiriquina does not at present exist.

The Blossom put to sea on the 24th, anchored three days afterwards at Valparaiso, and on the 29th took a final leave of the coast.

The island of Salas y Gomez, which was determined to be in latitude 26° 27' 46" S., and longitude 105° 20', has the appearance of three rocks. Its longest direction is N.W. and S.E., and its extent something less than half a mile in length, and a fifth of a

* Captain Beechey's text differs here from his nautical remarks by fifty leagues.

mile in width,—much less than has been stated. The surface was covered with rugged stones, of a dark brown colour, except where used as roosting places for the sea-fowl ; and from some observations, it seems probable that the island is of volcanic origin.

Between Salas y Gomez and Easter Island, they passed near the situation of an island named Washington and Coffin, reported to have been discovered by an American ship, but without perceiving any traces of it, though within four leagues of the spot, with a perfectly clear sky and horizon.

On the 17th of November they were off Easter Island. Captain Beechey is inclined to the opinion that this is the island upon which Davis had so nearly lost his vessel ; and, considering the rapid current that exists in the vicinity of the Galapagos, and which extends throughout the trade-wind, though with diminished force, the error in that navigator's reckoning he does not think more than might have happened to any dull-sailing vessel circumstanced as his was. The Blossom, in passing from the meridian of Juan Fernandez to Easter Island, was set 270 miles to the westward in eighteen days. Easter Island is 2000 miles from the coast of Chili, and 1500 from the nearest inhabited island, Pitcairn Island excepted, which has been peopled by Europeans. The geographical description of the island given by Mr. Berniget, who was engineer to the Astrolabe, was found to be perfectly accurate*. The population Captain Beechey estimates at about 1200. The natives tattoo themselves, so as to have the appearance of wearing breeches. Most of them go naked, though some wear the *maro*, which is made either of fine Indian cloth of a reddish colour, of a wild kind of parsley, or of a species of sea-weed. The straw hats mentioned by Cook and La Perouse appeared to be no longer in use. Captain Beechey thinks that the idea of there being a community of property among the islanders is extremely improbable. The interview of our navigators with them was very unfortunate, and terminated in a serious and unpleasant dispute.

Captain Beechey remarks, that those gigantic busts of stone which once existed on various parts of the island, of which Captain Cook found only two remaining, while Kotzebue found nothing more than a square pedestal in their place, have now altogether disappeared, and that a few heaps of rubbish only occupy a spot where it is doubtful whether one of the busts was erected or not. Pitcairn Island, he observes, affords a curious example of a race of men settling upon an island, erecting stone images upon its

* The highest part of it is 1200 feet, and in clear weather it may be seen at twelve or fourteen leagues distance.

heights, and either becoming extinct, or having abandoned it; and some circumstances connected with Easter Island occur in favour of the presumption that the same thing may also have taken place there. The most remarkable of these facts is, that the present generation is so nearly allied in language and customs to many islanders in the South Sea, as to leave no doubt of their having migrated from some of them; and yet in none of these places are there images of such extraordinary dimensions, or, indeed, in any way resembling them. The Easter Islanders have, besides, small wooden deities, similar to those worshipped by the inhabitants of the other islands just mentioned.

On the 28th of November the Blossom reached Ducie's Island. It is a coral rock, oval, with a lagoon in the centre, tenanted only by birds: the highest trees do not rise more than twenty-six feet above the level of the sea. It is situated in latitude $24^{\circ} 40' S.$, and longitude $124^{\circ} 45'$. The water was so clear over the coral, that the bottom could be distinctly seen when no soundings could be had with thirty fathoms of line. At seven miles distance, the island ceased to be visible from the deck.

On the 3d of December the ship reached Henderson's or Elizabeth Island, in latitude $24^{\circ} 21'$, and longitude $128^{\circ} 18' W.$ This is of a peculiar formation, very few instances of which are known—viz., dead coral, more or less porous, elevated in a flat surface, probably by volcanic agency, to the height of eighty feet. It is five miles in length, one in breadth, and thickly covered with shrubs, which make it difficult to climb. It was named Henderson's Island by the commander of the *Hercules*, of Calcutta, though first visited by the crew of the *Essex*, an American whaler, two of whom landed on it after the loss of their ship, and were subsequently taken off by an English whaler, who heard of their fate at Valparaiso.

On the 4th of December the expedition arrived at Pitcairn Island. The mutiny on board the *Bounty*; the terrible fate of the surviving mutineers, who sought refuge on this island, which exhibits traces of former inhabitants, and which presents great variety of soil and aspect, and is, further, abundantly provided with fish, fowl, and vegetables; the reform of Adams and his companion, and the patriarchal colony that rose under their care, are admirably related by Captain Beechey, but are foreign to our present purpose of strict geographical inquiry; and we will therefore content ourselves with stating that the island is about seven miles in circumference, surrounded by cliffs, or rocky projections, off which lie scattered numerous fragments of rock, rising, like so many black pinnacles, amid the surf, which, on all sides, rolls in upon the shore; and that its highest point was found to be 1109 feet above the level of the sea. The population, from the

period of its first establishment to the time of Captain Beechey's visit, varied as follows :—

		Males.	Females.
The first settlers consisted of	White (mutineers)	9	0
	Coloured (Otaheiteans)	6	12
		15	12=27
Of these were killed in quarrels between the whites and blacks	White	6	0
	Coloured	6	0
by accident	White	1	3
Died a natural death	—	1	3
		14	6—1 went away.
The original settlers, therefore, found on the island by the Blossom were		1	5
		10	10
The children of the white settlers (the men of colour having left none)		22	15
Their grandchildren		2	0
Recent settlers		1	0
Child of one of them		36	30
Present population		=66	

On the 23d of December the Blossom reached Oeno Island, in latitude $24^{\circ} 01' S.$, and longitude $130^{\circ} 40' W.$ This island is a coral formation—inclosing a lagoon with a small island in the centre, deep water all around, and a heavy surf. It is uninhabited, and was named Oeno Island after a whale ship, whose master supposed that it had not before been seen; but the discovery belongs to Captain Henderson, of the *Hercules*.

Crescent Island, which they reached on the 27th of the same month, is in latitude $23^{\circ} 20'$, or $23^{\circ} 17' S.$ by another observation, and in longitude $134^{\circ} 35' W.$ It is an oblong, three miles and a half in length, one and a half in width; and consists of a strip of coral about a hundred yards or less in width, having the sea on one side and a lagoon on the other. Its general height is two feet above the water. The soil, where highest, reaches just six feet above the sea,—and the tops of the trees are twenty feet higher. About forty natives were seen on this small spot: they were tall and well made,—tattooed, with thick black hair and beards. Three square stone huts, about six feet high, and sheds, some open on one side only, and others on both, were seen; but no cultivation could be discerned, nor any fruit-trees, which could have furnished subsistence.

On the 29th of December they reached the Gambier Islands. This group was discovered by the ship *Duff*, on a missionary voyage, in 1797, and named by Mr. Wilson, her commander.

It consists of five large islands and several smaller ones, all situated in a lagoon formed by a reef of coral, into which the Blossom effected a passage over a portion of the reef which dipped beneath the water, with five, seven, and eight fathoms, gradually deepening it to twenty-five fathoms. The largest island is about six miles in length, and rises into two peaks elevated 1428 feet above the level of the sea. These peaks, which were called after the Duff, are in form of wedges, and may be seen at a distance of fourteen or fifteen leagues. The island on which they occur Captain Beechey named after the first lieutenant, Peard Island; and the others in succession, Belcher, Wainright, Elson, Collie, and Marsh, after the other officers, and the lagoon, in which the ship was anchored, after herself. The islands appear to have been subjected to volcanic action, though not recently; and the account given of their geological structure, as extracted from Mr. Collie's Journal, gives details exactly similar to those presented by the older plutonic rocks in our own latitudes. The population may be estimated at about 1000; and the account given by Captain Beechey of their appearance, manners, dress, and occupations, of their mode of preserving the dead, and of their instruments of chase, warfare, and other utensils, presents many interesting features.

The Gambier Islands acquire considerable importance from the fact of their being the only station at present known (Pitcairn Island excepted) in a distance of 4000 miles between Otaheite and the coast of Chili, where a supply of good water can be procured. Two great streams from Mount Duff supplied the boats faster than it could be got off. Captain Beechey observed the old custom of taking possession of this group by hoisting the English ensign on the shore; and sowed several useful seeds, in the hope of their proving advantageous to the natives. At the S.W. extremity of these islands are several small sandy islands, over which the sea breaks heavily, so that they are lost amidst the foam. They were named the Wolfe Islands, from one of the midshipmen of the Blossom.

Lord Hood's Island, which Captain Beechey reached on the 14th of January, 1826, is in latitude $21^{\circ} 30'$ S. and longitude $135^{\circ} 33'$ W.: and consists of an assemblage of small islets rising from a chain of coral even with, or a little above the water's edge. Upon these grow a variety of evergreen-trees thickly set, and presenting an inviting appearance; but the surf forbade all attempts at landing. It appears, however, that the islets are not now inhabited, as Krusenstern reports them to have been, and as the appearance of a square stone hut was sufficient to prove. This coral rock, which was discovered by Mr. Wilson, in the ship Duff, is 11.2 miles in length and 4.7 miles in width, in a north and south

direction, and, like almost all the coral islands, contains a lagoon, and is steep on all sides.

The island of Clermont-Tonnerre, which was visited on the 18th of January, is ten miles in length, but very narrow, particularly at the extremities. It is of the same formation as Lord Hood's Island, but more elevated, and abounds with cocoa-nut trees. With the exception of a few breaks in the southern shore, by which the sea, when high, at times communicates with the lagoon, it is altogether above water. The lagoon has several small islands in it, and the shores all round are steep and abound with fish. The ship here encountered an unusually formidable water-spout, of which Captain Beechey gives an animated description, accompanied by a sketch of its appearance in three different stages of its progress. Captain Duperrey, in his voyage round the world, in the *Coquille*, visited this island, and, supposing it to be a new discovery, named it Clermont-Tonnerre, after the late French minister of marine. Captain Beechey seems, however, decided in his opinion that it was before discovered by the ship *Minerva*. The inhabitants are not above 200, and among them there was a great diversity of complexion. They were exceedingly shy, and the surf would not allow the *Blossom's* boats to land: latitude $18^{\circ} 33' 42''$ S., and longitude $136^{\circ} 01' 32''$ W.

Serle Island, the next visited, on January 21, is seven miles and a half in length, in a N.W. direction, and two miles and a quarter in width in its broadest part;—its latitude is $18^{\circ} 16' 01''$ S., and longitude $137^{\circ} 00' 45''$ W. It is a low strip of coral formation, and has several clumps of trees, which have been mistaken by some navigators for hillocks. The population altogether cannot exceed 100, and they resemble the inhabitants of Clermont-Tonnerre or *Minerva* island.

Whitsunday Island, discovered by Captain Wallis in 1767, is situated in latitude $19^{\circ} 23'$ S., and longitude $138^{\circ} 36'$ W., and forty miles to the westward of the place assigned to it by that navigator. A landing was effected here on January 23, and several huts were observed, with well-beaten pathways, and reservoirs for fresh water cut eighteen inches into the coral; but no inhabitants were seen. The island is a mile and a half in length, and not four miles, as stated by Captain Wallis, steep all round, of coral formation, well wooded, and contains a lagoon.

The same evening they bore up for Queen Charlotte's Island, also discovered by Captain Wallis, in latitude $19^{\circ} 17'$ S., and longitude $138^{\circ} 42'$ W. The coral here had so grown up that no lagoon could be perceived in the centre, and not a single specimen was to be seen of the numerous cocoa-nut trees found by Captain Wallis.

Lagoon Island, visited on January 24, in latitude $18^{\circ} 43' 19''$

S., and longitude $138^{\circ} 47' 13''$ W., is three miles in length, in a W. by S. direction, and a mile and a quarter in width. Two cocoa-nut trees in the centre of the island, which, Captain Cook observed, had the appearance of flags, are still waving; and, altogether, the island preserves the appearances described by that great navigator. The inhabitants of Lagoon Island, with whom the Blossom had some communication, were honest and friendly, forming a striking exception to the general character of the natives of Polynesia.

Thrum-cap Island, discovered and so named by Captain Cook, is of coral formation, three-quarters of a mile in length, well wooded, and steep all round; but no lagoon could be perceived. Bougainville gave this island the name of *Les Lanciers*, in consequence of the men whom he saw on it being armed with long spears;—they were most probably visitors from Lagoon Island, as no inhabitants were now seen. Its latitude is $18^{\circ} 30'$ S., and longitude $139^{\circ} 08'$ W. The Blossom was off it on the afternoon of the 24th, but the surf prevented the boats landing.

Egmont Island, Captain Wallis's second discovery, is steep like most other coral islands, and well wooded, with cocoa-nut and pandanus-trees. The men were armed in the same manner as the Lagoon Islanders; were friendly, and bartered freely for iron. It was examined on the 25th of January, but without landing.

Barrow Island, situated in latitude $20^{\circ} 45'$ S., and longitude $4^{\circ} 07'$ W. of Gambier, or $139^{\circ} 03'$ W. of Greenwich, was Captain Beechey's first discovery, on the 26th of January. It is a mile and three-quarters in length from north to south, and a mile and three-tenths in width; it consists of a narrow strip of land, of an oval form, not more than 200 yards wide in any part, well wooded, with three large pits under the trees, containing several tons of fresh water. It has a lagoon in its centre, which the colour of the water indicated to be of no great depth. Traces, apparently of Europeans, were observed on this island; but they were afterwards found to be the relics of the brief residence on these shores of some natives of the Chain Islands who had lost their way.

On the 2d of February the ship reached Captain Edwards' Carysfoot Island. It is a strip of coral so low that the sea washes into the lagoon in several places. Vegetation is scanty, but there are no dangers near the island. It is in latitude $20^{\circ} 44'$ S., and longitude $138^{\circ} 22'$.

The lagoon of Osnaburgh Island of Carteret, the next island visited, on the 3d of February, and which Captain Beechey proposes to call the island of Osnaburgh and Matilda, was entered by a channel sufficiently wide and deep for a vessel of the class of the Blossom. The remains of a shipwreck, supposed of the Matilda whaler, lost in 1792, were found on this island. It is fourteen

miles long, with many trees, but no cocoa-nut or other fruit-trees. It has never, apparently, been inhabited, and the birds were consequently so tame as to allow themselves to be lifted from their nests; while fish were taken as easily by sticks and boat-hooks as by lines. Latitude $21^{\circ} 53' 03''$ S., and longitude $138^{\circ} 59' 34''$.

To the south of this island another small island was examined, three miles and three-quarters in length by three in width, its form nearly an oblong, with the southern side much curved. The lagoon in the centre was deep, its boundary very low and narrow, and in places it overflowed. Captain Beechey gave this island the name of Cockburn Island. Latitude $22^{\circ} 12' 25''$ S., and longitude $138^{\circ} 39' 53''$ W.

The next island visited was the Lagoon Island of Captain Bligh. This is inhabited; the natives are darker than those of Cook's Lagoon Island,—nearly naked, with their hair tied in a knot on the top of the head, and provided with stones, clubs, and spears. No landing was effected on this island, which is in latitude $21^{\circ} 37' 41''$ S., and longitude $140^{\circ} 37' 58''$, and is larger than as exhibited on Arrowsmith's charts.

Byam Martin's Island, discovered by Captain Beechey, is in latitude $19^{\circ} 40' 22''$ S., and longitude $140^{\circ} 22' 28''$ W. It is an oval of three miles and three-quarters in diameter, of coral formation, and has a lagoon and productions very similar to the other islands recently described.

Gloucester Island, in latitude $19^{\circ} 07'$ S., and longitude $140^{\circ} 37'$ W., was found to differ very materially in its present form and extent from the descriptions given by its discoverer, Captain Wallis. At the south-east angle of the Island they noticed a morai built of stones, but there were no inhabitants upon the shore.

In latitude $18^{\circ} 04'$ S., and longitude $140^{\circ} 51'$ W., Captain Beechey visited Bow Island, discovered, in 1768, by Bougainville, and seen the following year by Captain Cook, who gave it its present name, from the resemblance which its shape was supposed to have to a bow. It is of coral formation, thirty miles long, and, at an average, five broad, well-wooded on the weather side, but scantily on the other, where it is so low that the sea, in places, washes into the lagoon. The Blossom, having navigated with considerable difficulty, and some danger, through a channel in the coral reef, was enabled to anchor in the lagoon. The strip of low land inclosing the lagoon is nearly seventy miles in extent, and the part that is dry is about a quarter of a mile in width. The lagoon is studded with coral knolls. This island is thinly inhabited, the natives not amounting to more than 100 souls. It is remarkable as having been visited for its pearl fishery, and an English brig was there at this time for the purpose, having hired divers from Chain Island. Water was procured in abundance,

and of tolerable quality, by digging holes through the sand into the coral rock.

The islands visited between Bow'Island (which they quitted on the 20th February) and Otaheite were all of the same nature and formation as those already described, and furnished no additional information beyond the correct determination of their size and position. Among the number are two which were previously unknown: the largest of these, which was also the most extensive of their discoveries in the archipelago, Captain Beechey named Melville Island; and the other Croker Island; but the narrative contains no details of the appearance of these islands. Those whose position was determined were as follows:—

		Lat. South.	Long. of Greenwich.
	Moller Island	17° 44'	140° 35'
	Resolution Island . . .	17 22 . .	141 23
	Cumberland Island . . .	19 10 . .	141 10
	Prince William Henry Island, } or Lostange	18 49 . .	141 42
Two groups {	Dawahaidy	18 18 . .	142 06
	Maracan	17 58 . .	142 08
	Doubtful Island	17 19 . .	142 22
	Melville Island	17 34 . .	142 39
	Bird Island	17 48 . .	143 04
	Croker Island	17 26 . .	143 23
	Maitea Island	17 53 . .	148 00

The discoveries of Cook and Wallis in the track followed by Captain Beechey are relatively correctly placed; but those of the latter are as much as forty miles in error in longitude, and several miles in latitude, which has occasioned two of them to be mistaken for each other by Bellinghausen, and one to be considered as a new discovery by Captain Duperrey; but Captain Beechey considers that there can be no doubt but that this navigator's Lostange Island is the same as Wallis's Prince William Henry's Island.

Of the thirty-two islands visited in succession, only twelve were inhabited, including Pitcairn Island; and the amount of the population altogether, Captain Beechey supposes, cannot possibly exceed 3100 souls, of which 1000 belong to the Gambier Islands, 1260 to Easter Island, leaving 840 persons only to occupy the other thirty.

Captain Beechey thinks that there is a great diversity of features and complexion between the natives inhabiting the volcanic islands and those of the coral formations—the former being a taller and fairer race. This, he remarks, may be referred to a difference of food, habits, and comfort; the former having to seek a daily subsistence upon the reefs, exposed to a burning sun, and

to the painful glare of a white coral beach ; while the others enjoy plentifully the produce of the earth, repose beneath the genial shade of palm or bread-fruit trees, and pass a life of comparative ease and luxury.

In approaching Otaheite, the mountains were seen at the distance of ninety miles, making their height, on a rough computation, to be 7000 feet ; and the island of Maitea was found to be 1432 feet above the sea.

As Captain Beechey wished to prepare his ship and recruit the sailors at Otaheite, previous to his journey northward, he repaired thither after the examination of the archipelago, and anchored, on the 18th of March, in the outer harbour of Soanoa, about four miles westward of Matavai Bay, in Otaheite ; but as the details connected with the stay of the *Blossom* at these islands do not present us with any facts of immediate interest to geography, we shall not dwell upon this part of the narrative.

On the 26th of April, the ship left the island mentioned above, and reached the low island of Tetharoa, in latitude $17^{\circ} 02' S.$, and longitude $149^{\circ} 30' W.$, the watering-place of the Otaheitans.

On the 20th of May, the *Blossom* came to anchor at Honoruru, the principal port of the Sandwich Islands. On the 1st of June they hauled into Oneehow, the westernmost island of the Sandwich group, in latitude $21^{\circ} 52' N.$, and longitude $160^{\circ} 23' W.$, where Vancouver anchored. This island is famous for its yams, fruit, and mats.

On leaving this island, Captain Beechey shaped his course for Kamschatka, in doing which he deviated from the tracks of both Cook and Clarke, passing to the eastward of Bird Island, and gaining the latitude of $27'' N.$, and on the 28th of June anchoring off the town of Petrapaulski, in latitude $53^{\circ} 00' N.$, and longitude $201^{\circ} 16' W.$ On the 1st of July they weighed anchor again, but only succeeded in getting out of the harbour on the 5th. On the 10th, Beering's Island was close upon them. Its latitude was determined to be $55^{\circ} 22' N.$, and longitude $194^{\circ} 00' W.$ On the 17th, they were off St. Lawrence's Island, when they had communication with the natives, who came off in baidars ; and on the 19th of July they saw the island of King, which is described as small, but high and rugged.

Captain Beechey examined the Diomed Islands, which were seen from the mast-head at fifty miles distance, and found them to be three in number, as first advanced by Captain Cook, and since put in doubt by Kotzebue, who mentions a fourth, probably East Cape. Captain Beechey named the eastern one Fairway Rock, latitude $65^{\circ} 38' N.$, and longitude $168^{\circ} 43' W.$ To the centre one he left its original name of Krusenstern, latitude $65^{\circ} 46' N.$, and longitude $168^{\circ} 55' W.$; and the north-western is

named Ratmanoff, and is in latitude $65^{\circ} 51' N.$, and longitude $169^{\circ} 63' W.$

After doubling Cape Prince of Wales, they were becalmed in Schismareff inlet. This broad sheet of water extends inland in an E.S.E. direction, and is backed by distant mountains. Saritcheff Island lies immediately before the opening, which is ten miles wide.

From this inlet they sailed northward, the coast being low and swampy, with small lakes inland; and entered Kotzebue Sound on the 22nd of July, naming a deep inlet on its northern shore, which had escaped Kotzebue's observation, Hotham Inlet, afterwards examined by Mr. Elson. As the object of the expedition was now to afford every assistance in their power to their countrymen engaged in exploring the arctic lands and seas, Captain Beechey proceeded directly to Chamisso Island, the point of rendezvous, which they reached on the 25th July, 1826, five days only after the appointed time,—subsequently examining the coast for a considerable distance to the N.E. in the Blossom, and in the ship's barge, which attained a western longitude of $156^{\circ} 21'$ at Point Barrow. The expedition was unsuccessful in obtaining any information of the proceedings of Captain Sir John Franklin in their first visit to the polar seas, and equally so on their return to the same latitude in the following year. The privations and suffering to which the crew of the ship were exposed during their arduous navigation, reflect the highest credit on their characters as sailors; and a careful and accurate examination of the coast was made under circumstances which demanded great fortitude and perseverance. The results of this examination we shall now point out, beginning at Kotzebue Sound, in which the Blossom was anchored on several different occasions. Cape Espenberg, its north-west extremity, is in latitude $66^{\circ} 34' N.$, and longitude $163^{\circ} 36' W.$ It is a narrow strip of land, on which are some high sand-hills, and a great many poles are placed erect upon it. The sea penetrates to the southward of this cape, but the entrance is closed by a bar which stretches all along the coast, extending to the inlet which Captain Kotzebue meditated to explore in baidais, and was very sanguine that it would lead to some great inland discovery. The extreme shallowness of the water prevented the examination of this inlet by the gig of the Blossom. The whole of the coast here is swampy, low, and intersected by lakes and rivers. The rounded hills which bound the horizon of the sound to the northward branch off inland at this point; and a distant range, of a totally different character, rises over the vast plain that extends to Cape Espenberg, and forms the whole of the western side of Kotzebue Sound. The land on the south side of the Bay of Good Hope is higher, more rocky, and of a bolder

character than the opposite shore, though it still resembles it in its swampy covering, and in the occurrence of lakes wherever the land is flat. Cape Deceit, so named by Kotzebue, is a bold promontory with a conspicuous rock off it. It appears to be composed of compact limestone, in large angular blocks. To the east of Cape Deceit are two bays, each with a river, having bars across their entrances. The first promontory eastward appears to be composed of limestone; on the second they met with slaty limestone, talcaceous slate, and alum slate. The extent of Spafareif bay is about three miles, when it separates into a number of small branches communicating with several lakes. The coast of this part of the sound was found covered with a deep swampy moss. A range of hills extends eastward to Escholtz Bay, which terminates in a river about a mile and a half in width, and broken, at the time it was visited, into narrow and intricate channels by banks—some dry, and others only partly so. The shore around is flat, broken by several lakes, with cliffs principally formed of diluvial clay; and Captain Beechey has satisfactorily shown, that the bones which the naturalists of Kotzebue's expedition believed to have been incased in ice, were embedded in this clay. From Elephant Point westward to the neck of Choris Peninsula, the shore is difficult of access on account of long muddy flats extending into the bay, and, in some places, dry at low water, a quarter of a mile from the beach. The land about this part of the sound is generally characterised by rounded hills, from about six hundred to a thousand feet above the sea, with small lakes and rivers. Its surface is rent into deep furrows, which, until a very late period in the summer, are filled with water, and being covered with a thick swampy moss, or with long grass or bushes, it is extremely tedious to traverse it on foot. Chamisso Island, the highest part of which is 231 feet above the sea, is steep, except to the eastward, where it ends in a low sandy point, upon which are the remains of some Esquimaux habitations. It has the same swampy covering as the land before described, from which, until late in the summer, several streams descend, and are very convenient for procuring water. Detached from Chamisso there is a steep rock, which was named Puffin Island, from the quantity of those birds which built upon its projecting crags. It is composed of mouldering granite, which has broken away in such a manner that the remaining part assumes the form of a tower.

North of Chamisso Island is Hotham Inlet. It is of considerable width, and extends thirty or forty miles in a broad sheet of water, which, at some distance up, was fresh. The entrance of this inlet was so shallow that the barge could not enter. There is a shoal off the entrance, and in the middle of the channel there were

only five feet water at half flood. The shoal extends eight miles off the land, and is very dangerous, as the soundings give very short warning of its proximity. Cape Krusenstern is a low tongue of land, intersected by lakes, lying at the foot of a high cluster of hills, not in any way remarkable. The coast here takes an abrupt turn to the northward, and the current sets strong against the bend. To the north, plains extend from the hills to the sea, composed of elastic bog earth, intersected by small streams, on the edges of which the buttercup, poppy, blue bell, pedicularis, vaccinium, saxifrage, and some cruciform plants, throve well. In other parts, however, the vegetation was stunted, and consisted only of lichens and mosses. Cape Mulgrave of Captain Cook is a range of hills, which terminate in a plain intersected by lakes near the beach, and probably not observed by that navigator. The next cape northward was named Cape Thomson. It is a bold promontory, 450 feet in height, and marked with differently coloured strata. A cape close to this has been named Cape Ricord, by the Russians. Low land was observed stretching out from Cape Thomson to the W.N.W., as far as the eye could reach: Captain Beechey named it Point Hope. The farthest land in sight to the northward answered to Cape Lisburn of Captain Cook. The mountain above the cape attained a height of 850 feet above the sea. The basis of this mountain was limestone, with beds of flinty slate. There was little soil in the valley, and the stones were covered with a thick swampy moss. The land here turns to the eastward towards a cape, which was named Beaufort. The land northward was low and swampy, covered with moss and long grass. Cape Beaufort is situated in the depth of a great bay, formed between Cape Lisburn and Icy Cape, and is the last point where the hills come close down to the sea, by reason of the coast line curving to the northward, while the range of hills continues its former direction.

The Cape is composed of sandstone traversed by narrow seams of coal, and from these sandstone hills there is an uniform ascent to the rugged mountains of limestone and flint at Cape Lisburn; the range is, however, broken by extensive valleys, intersected by lakes and rivers. Icy Cape, the farthest point reached by Cook, is very low, and has a large lake at the back of it, which receives the water of a considerable river, and communicates with the sea through a narrow channel much encumbered with shoals. The main land on both sides of Icy Cape, from Wainwright Inlet on one side to Cape Beaufort on the other, is flat and covered with swampy moss. It presents a line of low mud cliffs, between which and a shingly beach that everywhere forms the coast line, there is a succession of narrow lakes capable of being navigated by baidars or small boats. The farthest tongue of land which Mr. Elson

reached in the Blossom's barge was named Point Barrow.—It lies 126 miles to the north-east of Icy Cape, and is only 146 miles from the extreme of Captain Franklin's discoveries, in his progress westward from the Mackenzie River. The bay, which appeared to be formed to the eastward of this point, was named Elson's Bay. To the nearest conspicuous object to the southward of Point Barrow Captain Beechey gave the name of Smyth; and other points and inlets to the southward are also named. A chain of sandy islands, lying some distance from the mainland off Cape Franklin, were called Sea-horse Island; and beyond, a bay, formed by the junction of this chain of islands with the mainland, was called Peard Bay. The land from Cape Smyth, which was about forty-five feet in height, slopes gradually down to Barrow Point, which is very low. Thus, by the expedition of the Blossom's barge, about seventy miles have been added to the geography of the polar regions; and the distance between Captain Franklin's discoveries and those of the Blossom has been brought within so small a compass as to leave very little room for further speculation on the northern limits of the continent of America. The actual distance left unexplored is reduced to 146 miles; and there is much reason, Captain Beechey says, to believe, from the state of the sea about Point Barrow, and along that part of the coast which was explored by Captain Franklin, that the navigation of the remaining portion of unknown coast, in boats, is by no means a hopeless project.

In his voyage in the ensuing year in these seas, and on his return to the southward, Captain Beechey discovered Port Clarence and Grantley Harbour. To the southward of Cape Prince of Wales, the coast trends to the east and assumes a totally different character to that which leads to Schismareff Inlet, being bounded by steep rocky cliffs and broken by deep valleys, while the other is low and swampy ground. To a bold promontory, which advances into the sea beyond this, the name of York was given; to the eastward of which is a low spot of land projecting about ten miles from the coast, forming a right angle, and having a channel about two miles wide between its extremity and the northern shore, which is the entrance to Port Clarence. At the north-east angle of this harbour is an opening leading into Grantley harbour, which is ten miles in length by two and a quarter in width, with an almost uniform depth of two and a half and three fathoms water, beyond which there is a strait, in all probability communicating with a large inland lake. To the points at the entrance of Port Clarence, Captain Beechey gave the names of Spencer and Jackson.

Captain Beechey weighed anchor from Kotzebue Sound on the 13th of October, 1826; and, passing Cape Krusenstern, and suc-

cessively King Island and the group of St. Paul's, sailed through the strait westward of Oonemak, which is nine miles and a half across. On the 5th of November he made the high land of New Albion, passed the promontory of Punta de los Reyes, and, on the 8th, arrived at San Francisco. Previous to the departure of the Blossom for Monterey, a land expedition, consisting of Messrs. Collie, Marsh, and Evans, was made to that port, which was very productive to the collections of natural history.

The Blossom left Monterey for the Sandwich Islands on the 5th of January, 1827, and on the passage searched unsuccessfully for those islands that were marked near the route, rounding-to every night when near the position of any one, that it might not be passed unobserved, and making sail on a parallel of latitude during the day. In this manner Henderson's and Cooper's Islands were sought for, besides several others said to lie near them, and also a group in the latitude of 16° N., and longitude between 130° and 133° W.; but nothing was seen even there of them, nor any of the usual indications of land; so that if these islands exist, they must be in some other parallel than that assigned to them in the American 'Geographical Table' for 1825.

On the 26th of January the Blossom anchored in the harbour of Honoruru; and, after a stay of thirty-nine days, put to sea again. On the 25th of March the island of Assumption was passed. Arrowsmith has incorrectly placed the Mangs on the south side of Assumption, as, by the astronomical bearings of the Blossom, they are situated N. $27^{\circ} 7' 30''$ W. (true) from the south-east end of that island, and are in latitude $19^{\circ} 57' 02''$ N. They consist of three high rocks, lying in a south-easterly direction. Captain Beechey did not observe the rocks discovered by Freycinet in latitude $19^{\circ} 32' 00''$ N., and which he supposed to be the Mangs: if both latitudes are correct, he must have passed within four miles of them.

A contrary wind, which rendered it necessary to beat through the channel between the Bashee Islands and Botel Tabago Xima, afforded an opportunity of connecting these islands trigonometrically, and of obtaining transit bearings when in intermediate stations between them; and from these observations, compared with the chart of Captain Horsburgh, the latter appeared to be constructed with great care and accuracy.

Captain Beechey was anxious, on leaving Macao, where he arrived on the 10th of April, to explore the sea to the eastward of Loo Choo. He was, however, prevented doing so by variable winds and contrary currents, and was obliged to steer directly to the latter place.

During his stay at Loo Choo, Captain Beechey completed the survey of the port of the town of Nepa, or Papa Ching, which

he does not consider to be the capital of Loo Choo, but rather a town situated upon a hill, and surrounded by a wall, called by the natives Shui, or Shoodi: its extent could not, however, be ascertained, from the dense foliage by which it was surrounded. The officers of the Blossom made several excursions into the interior, visiting the public cemeteries, a temple of Budh, and some cotton manufactories. Captain Beechey mentions sweet potatoes, millet, wheat, Indian corn, rice, potatoes, cabbages, barley, sugar-cane, pease, tea-shrubs, taro, tobacco, capsicums, cucumbers, cocoa-nuts, carrots, lettuces, onions, plantains, pomegranates, and oranges, as growing on Loo Choo. The narrative contains some interesting details upon the natives, which make us feel grieved that the expedition was not prepared with linguists, to clear up some doubtful points in the history and character of this singular people.

The Blossom sailed from Loo Choo on the 25th of May, 1827; and on the 6th June passed upon the spot where the Island of Disappointment is placed in the latest charts, without seeing land.

On the 8th they reached the Bonin Islands, which are all small, but remarkable. The central island was named Kater, and the largest in the cluster Peel. This island has a good port, to which Captain Beechey gave the name of Port Lloyd. In this island, almost every valley has a stream of water; and the mountains are clothed with trees, among which the *Areca oleracea* and fan-palms were conspicuous. There are several sandy bays, in which green turtle are sometimes so numerous that they hide the colour of the shore. The sea yields an abundance of fish: sharks also abound, and are very voracious. These islands are subject to earthquakes, and have every appearance of being of volcanic origin. A large bay at the north-east angle of Peel Island, was named Fitton Bay. Captain Beechey controverts the propriety of the name of Bonin-Sima being given to these islands, which do not agree with the account given of them by Abel Rémusat and Klaproth, taken from Japanese documents, but correspond more nearly with the *Yslas del Arzobispo*, described many years ago in the '*Navigação Especulativa y Pratica*,' published at Manilla. Kæmpfer's description of the islands of Bonin-Sima may, however, be safely referred to the Archbishop's Isles. The group consists of three clusters of islands, lying nearly N. by E., and extending from the latitude of $27^{\circ} 44' 35''$ to $26^{\circ} 30' N.$, beyond which was the utmost limit of their view to the southward. The northern cluster was named Parry Islands. The middle cluster consists of three, of which Peel's Island is the largest. This group is nine miles and a quarter in length, and is divided by two channels, so narrow, that they can only be seen when abreast of them, and are not navigable by shipping. The northern island

was named Stapleton, and the centre Buckland. At the south-west angle is a bay, with good anchorage, which was called Walker's Bay. The southern cluster visited by Mr. Coffin in 1823, in a whaler, was named Baily Islands.

Captain Beechey, having now spent so much time in low latitudes, was obliged again to steer to the inhospitable seas of the North; but as we have already embodied the results of this second journey, we shall not dwell upon the difficulties and dangers with which this navigation was attended. In the month of October, 1827, he was on his return; and on the 29th anchored at Monterey. He remained at this harbour until the 17th of November, and then sailed for San Francisco. The Blossom afterwards put into San Blas and Mazatlan, taking the opportunity of examining the Tres Marias and Isabella Islands, an account of which is inserted in the nautical remarks. On the 29th of March, 1828, after several delays, they crossed the equator in $99^{\circ} 40' W.$, and arrived at Valparaiso on the 29th of April. On the 23d of May they arrived at Coquimbo, from which port they finally put to sea on their way to Brazil, passed the meridian of Cape Horn on the 30th of June, and arrived at Rio Janeiro on the 21st of July. After a passage of forty-nine days they arrived at Spithead; and, on the 12th of October, the ship was paid off at Woolwich.

HYDROGRAPHY.—That part of Hydrography which would more particularly come under the observation of a nautical expedition, would be the natural history of the sea; and we may perhaps notice the observations made on the direction and intensity of currents as the most interesting of this class. In the passage from Teneriffe to Rio Janeiro, from June to July, it appears that the N.E. trades propelled the waters, in a S.W. by W. direction, at the average rate (and it is to be remarked, that all the rates given are averages) of eleven and a half miles per diem; and the S.E. trades to the W.N.W. with double the velocity, or twenty-two and a half miles per day; and that in the intermediate space, where light variable winds prevailed, a strong current was observed, running in a contrary direction to both these, at the rate of thirteen miles per day. Humboldt, Sir Erasmus Gower, and others, who have given the rate of the current in the Atlantic between the tropics, have limited its motion to eight and ten miles a day. It was Captain Beechey's intention to have given a table of currents in the Appendix, but this was omitted for want of space. In the South Pacific Ocean, about the parallel of 27° , the currents averaged nine miles a day; and nearer the equator, *i. e.* from $18^{\circ} S.$ to $4^{\circ} N.$, including the meridian of Otaheite 16° , five miles per day. Nearer the coast of South America, between the parallels of $8^{\circ} N.$ and $19^{\circ} S.$, about the meridian of $103^{\circ} W.$, it was further increased to twenty-eight miles a day.

In both oceans there appears to be, on the whole, a north-easterly current between the trade winds. In the Atlantic it was found to average thirteen miles a day; and in the Pacific, twenty-three miles a day. In the vicinity of the Gallapagos, however, there is an exception to this remark, as the current there appears always to run to the westward, and with considerable rapidity.

The rates of the currents in both oceans are materially different in different meridians: those in the Atlantic increasing with westerly longitudes, and those in the Pacific, on the contrary, decreasing—the former attaining its maximum near the Gulf of Mexico, the latter near the Gallapagos. They are also affected by the westerly monsoons.

Questions connected with the saltness of the ocean, which may be obtained by its specific gravity, are also of much hydrographical interest. It has been supposed, that, with the exception of certain gulfs, into which large fresh-water rivers emptied themselves, the saltness of the ocean diminishes towards the poles; but the experiments of Bladh, reduced by Kirwan to the temperature of 16° , do not justify this opinion, which is further not supported by the researches of De Humboldt. Captain Beechey has appended a table of experiments to his narrative, in which the specific gravity of the surface of the sea, reduced to the temperature of 60° , and corrected for the error of the hydrometer, is given for every second degree of latitude. From these tables, it would appear that the specific gravity is at its maximum between the tropics,—that it increases to about 40° N. lat.,—and then again diminishes. In the South Atlantic, the specific gravity of the seawater was also found to be less in the highest latitudes; and the same results were obtained from the observations of 1825 and 1828. In the Pacific Ocean, where the experiments ranged from the equator to 71° N. latitude, and from the equator to 88° S. latitude, the results are still more striking; and accord remarkably with those obtained by Drs. Marcett and Traill, and Captains Scoresby and Ross. No experiments are recorded on the comparative saltness of the surface and the deep water.

METEOROLOGY.—The meteorological researches are confined to observations on the aurora borealis, and on the pressure, temperature, and humidity of the atmosphere. The expedition had frequent opportunities of observing the aurora borealis in the autumns of 1826 and of 1827. From the 25th of August, on which day it is remarkable that in both years it made its first appearance, until the 9th of October, about the time of the departure of the Blossom from the northern regions, in both years this beautiful meteor was visible every night that was clear, or when the clouds were thin and elevated: it never appeared in wet weather. In 1826, when the weather was settled,

the aurora generally began in the W.N.W. and passed over to the N.E. until a certain period, after which it as regularly commenced in the N.E. and passed to the N.W.; whilst in 1827 the appearances of the meteor were as uncertain as the season was boisterous and changeable. The period when this change in the course of the light took place coincided very nearly with that of the equinox. The meteor was uniform in making its appearance always in the northern hemisphere, and generally in the form of elliptical arches from 3° to 7° of altitude, nearly parallel with the magnetic equator. The arches, when formed, in general remained nearly stationary, and gave out coruscations, which streamed towards the zenith. These observations agree with those of Mr. Dalton, who always found a similar coincidence when the arches were complete. The light was decidedly seen between a fleecy, cloud-like substance and the earth. The proofs of this meteor belonging to the regions of our atmosphere were strengthened by different appearances of the meteor, and may be considered as completely established by the observations of Captains Franklin and Parry. The aurora was never attended by any noise, nor was any disturbance of the needle observed. It must be remarked, that Kater's compass was the only instrument observed, and then on board the ship only. Mr. Collie, the surgeon of the Blossom, has advanced an ingenious hypothesis on the nature of the aurora. It is probable that the new discoveries which are daily enriching science in electro-magnetism will remove many of the doubts which prevail on the nature and origin of this interesting meteor.

The Barometrical observations include researches on the horary oscillations, and on the mean altitude of the column of mercury at different parallels. The instrument used was an iron cistern marine barometer, of Jones's make: neutral point, 30.102; capacity, $\frac{1}{2}\frac{1}{3}$; temperature, 52. It was suspended in Captain Beechey's fore cabin, and, with the exception of the first five months, registered every three hours. The diurnal variations are thus also contained in these researches. It has been supposed, that while the irregular oscillations appear almost null at the equator, and increase in extent towards the poles, the regular oscillations would appear to follow a contrary law, and diminish in extent towards the poles. The extent of the vibration of the column of mercury between the tropics was observed by Captain Beechey to be, in the North Atlantic, .038; in the South Atlantic, or between the equator and the tropic of Capricorn, to be .067; and the amount of the horary oscillations between both tropics was, for 3 A.M. — .026, for 9 A.M. + .019, noon + .011, 3 P.M. — .030, 9 P.M. + .014, and for midnight + .011. The mean vibration or extent from maximum to minimum, between the tropics, was, for the North Pacific, .059, and for the South Pacific,

.027; and the mean periodical oscillation for 3 A.M.—015, 6 A.M.—005, 9 A.M.+006, noon+005, 3 P.M.—025, 6 P.M.—004, 9 P.M.+018, and for midnight, +015. It is hardly necessary to dwell upon the dates given for the mean altitude of the barometer in different latitudes: as compared with one another the results are useful; but the true height of the column of mercury in any given place can only be obtained from the annual mean, which, at the level of the sea and at the same temperature, is everywhere pretty nearly the same. The highest range of the barometer in the polar regions observed by Captain Sir E. Parry was 30.86, which it attained in Melville Island, on the 27th of April, 1820; and Captain Beechey observed the barometer at 30.32 in Kotzebue Sound, on September 1st, 1826.

The tables of the observed temperature and humidity of the air in different parallels, and which have been used in the correction of errors, are minute, and extremely useful for reference.

The practical application of observations on the temperature of the sea have, as far as we know, been only twofold. The celebrated Franklin first fixed the attention of natural philosophers on the phenomena which are presented in the temperature of the ocean above shallows, and his remarks have since been verified by De Humboldt. Captain Beechey mentions in his narrative some remarkable cases where changes in the temperature of the surface of the sea were forerunners of shifts of wind, which he thinks they preceded, even before any change in the temperature of the air. The observations on the temperature of the surface of the sea in the Appendix of Captain Beechey's work were made every four hours, by plunging a thermometer into a bucket of sea water immediately it was drawn up, and they are compared with the mean of bi-horal observations on the temperature of the air. The mean only of the daily observations being given, we cannot ascertain how far they verify Péron's notions on the variations between mid-day and midnight, and the relation of these to the temperature of the ambient air at the same period; but the observations on the temperature of the surface of the sea, compared with that of the atmosphere, appear to demonstrate that, in the same situation, the former is greater than the latter, and, consequently, that the law in hydrography is correct, which establishes that the mean term of the temperature of the waters of the ocean at their surface, and far from the continents, is greater than that of the atmosphere with which the waters are in contact. This is more particularly true with regard to the equatorial and inter-tropical regions, as also to seas distant from land, for exceptions were met with in Kotzebue Sound and in other places. Observations on the temperature of the sea at different depths are perhaps of still greater interest, both on account of the difficulty attendant on experiments of that

character, of the discussions which are yet involved in the results of former experiments, and of the light which they assist in throwing on the temperature of the globe and the theory of the earth. The observations made during the expedition of the Blossom were with self-registering thermometers, at various depths, from 50 to more than 700 fathoms; and in all cases it appears that the temperature diminishes with the depth to a certain distance, when it begins to increase again, or at least remains stationary; and this depth appears to vary from 300 to 500 fathoms. The experiments at depths beyond this were too few to allow of any satisfactory results; but it appears, as in the experiments of the Russian expedition recorded by Lentz, that below 400 fathoms the temperature was nearly stationary. The difference of temperature between the surface and a depth of 700 fathoms, as observed by Captain Wauchope, in H.M.S. Euryene, amounted to 31° . There are several experiments made by Captain Beechey, in which the difference amounted to 35° , 36° , and 37° , and in one case to $39^{\circ}.5$; this was at a depth of 400 fathoms. At 784 fathoms in the North Pacific, the difference was $36^{\circ}.8$; and in the same place, at 600 fathoms, 37° ; at 760 fathoms, the difference was $35^{\circ}.5$; and in the same place, at 575 fathoms, 35° . In the South Atlantic, at a depth of 854 fathoms, the difference was only $10^{\circ}.4$.

MAGNETISM.—The observations on terrestrial magnetism were on the dip of the magnetic needle, on the intensity of the magnetic force, and on the variation of the compass with Barlow's plate attached. The dips were observed with the same instrument which had been used at Melville Island: it had two common needles, and another with a moveable weight, fitted up on Professor Mayer's principle. No. 1 was used solely for observations on the magnetic intensity, and its poles consequently were never reversed; while No. 2 and Mayer's were employed for dips, and had their poles changed at each observation. The horizontal needle was suspended in a stirrup by a fine silk, in an octagon wooden box, furnished with a graduated wooden circle on the inside, and covered with a glass top, in which there was fitted a contrivance for moving the needle out of the magnetic meridian. Until the arrival of the ship at Woahoo, the stay at each place was too short, and Captain Beechey's time was too much occupied with astronomical observations, and with the business of surveys, for him to give the necessary attention to these delicate observations; but after that period the observations were regularly made. Unfortunately for the completion of the series upon the magnetic intensity, the needles used for that purpose became corroded upon the passage from Loo Choo to Petropaulski, by which their magnetic power was much diminished; and as the amount of the change

could not be ascertained, Captain Beechey thought it advisable not to introduce the observations into the published tables. The following table will present the result of the observations on dips :—

	Lat. N.	Long. W.	Mean dip. N.
1826 N.W. America . . .	70° 31'	160° 30'	81° 63'
Chamisso Island . . .	66 12	161 46	77 39
England . . .	Egham		69 58
Petropaulski . . .	53 01	201 15	64 02.3
San Francisco . . .	37 48	122 24	62 35.2
Macao . . .	22 12	246 28	29 57.5
Woahoo . . .	21 18	158 00	40 33
Loo Choo . . .	26 12	232 18	35 01.7
Acapulco . . .	16 50	99 51	38 58

The observations on the horizontal needle confirm the generally received law, that the intensity of the magnetic force increases as we proceed from the equator to the poles, though the ratio of that increase, as resulting from former experiments, is rather greater than is indicated by the experiments of Captain Beechey. The intensity of the magnetic force, which is in proportion to the square of the number of vibrations made in a given time, is also added to the table of observations, both in its observed and computed ratios.

The observations on the variation of the compass were made with Barlow's plate attached; the local deviation of the needle was ascertained by swinging the ship at Spithead, and the position of the plate determined by the directions which accompanied it. In 1827, it became necessary to alter the position of the plate a little, on account of a different distribution of the iron in the ship. This was done pursuant to experiments made at Petropaulski. These observations, exceedingly minute and numerous, are of the greatest interest to terrestrial magnetism, and, compared with Professor Hansteen's chart of the variations and dip of the needle, furnish additional proof of the accuracy which this branch of science is now attaining. A table is appended, containing the variation of the compass from observations made on shore at different parts of the globe, principally with two of Kater's compasses, the errors of which were 8° 58' and 2° 18' respectively.

PHYSICAL GEOGRAPHY.—Physical Geography, in addition to the history of the mountains, plains, and valleys, or the contrasted configurations of the earth's surface, embraces Geographical Zoology and Geographical Botany; but as the natural history of this voyage is to be published in separate volumes, and as the geographical distribution of the plants or animals can only be connected with an accurate knowledge of the species met with in different places, we must defer any detailed account of these results until the materials furnished by the scientific labours of the

naturalists and officers attached to the expedition are placed at our disposal.

There are, however, some points of importance to Physical Geography noticed in the narrative, which it would be improper to pass over. We allude more particularly to the information given of the character and formation of the coral islands which are scattered over the great Southern Pacific Ocean, and which appear to be daily forming new abodes for the roving tribes of those archipelagoes. The observations of Captain Beechey on this subject, illustrated by excellent engravings and diagrams, are of great interest. We shall first briefly notice these observations, and then consider the general views which result from them.

Forster, and other naturalists, have imagined that the polypi of the corals build upwards to a certain height, raising their habitation within a little of the surface of the sea, which gradually throws shells, weeds, sand, small bits of coral, and other things, on the tops of these coral rocks, at last fairly raising them out of the water; but Captain Beechey makes the important observation, that it is the abrupt descent of the external margin which causes the sea to break upon it, and prevents these strips being inundated, and the loose sands, divested of any loose materials, heaped upon them, are rarely elevated more than two feet above the level of the sea.

Those parts of the strip which are beyond the reach of the waves are no longer inhabited by the animals that reared them, but have their cells filled with hard, calcareous matter, and present a brown, rugged appearance. The width of the plain, or strips of dead coral, which came under Captain Beechey's observation, in no instance exceeded half a mile, from the usual wash of the sea to the edge of the lagoon, and in general were only about three or four hundred yards. Beyond these limits, on the lagoon side in particular, where the coral was less mutilated by the waves, there was frequently a ledge two or three feet under water at high tides, and thirty to forty yards in width; after which the sides of the island descended rapidly, apparently by a succession of inclined ledges, formed by numerous columns united at their capitals with spaces between them, in which the sounding lead descended several fathoms. The islands slope on both sides by an almost imperceptible inclination to the first ledge. The entrances to the lagoons generally occur on the leeward side, though they are sometimes situated on a side that runs in the direction of the wind, as at Bow Island. All the points or angles of these islands descend into the sea with less abruptness than the sides, and with more regularity. The wedge-shaped spaces that the meeting of the two sides would form in the lagoon is filled up by the ledges being broader there. In such places, as well as in the narrow part of the lake, the polypi are in greater numbers: they appear

to rise to the surface in the form of a truncated cone, and then their progress being stopped, they work laterally : so that if several of them were near each other, they would unite and form a shelf similar to that which exists round the margin of some of the lagoons. Some of the lagoons which the Blossom entered were from twenty to thirty-eight fathoms in depth. A fact, however, in contradiction to Captain Beechey's opinion, has been previously mentioned by Chamisso ; nor were there wanting surmises of what perhaps this navigator has the credit of proving satisfactorily—that the wall of coral which encircles these islands is so narrow and perfect, that they have been improperly designated as groups or chains of islands, in consequence of the wall being broken by channels into the lagoon ; for, on examination, the chain is found continuous under water, and as in all probability it will in time reach the surface, and become dry, the whole of the group may generally be considered as one island.

We may remark that the observations of Captain Beechey, while they correspond with those of the French naturalists in many points, do not favour the hypothesis of former navigators, that the saxigenous polypi raise their habitations gradually from a small base, always spreading more in proportion as the structure grows higher : an hypothesis which is objectionable on many grounds.

There can now be no doubt, from the situation of these coral islands with respect to each other, as they often form rows, their union in several places in large groups, and their total absence in other parts of the same seas, that the polypi have founded their buildings on shoals of the sea, or on the tops of mountains lying under water ; but it is quite incorrect to suppose, with Messrs. Quoy and Gaimard, that there are no islands of any extent constantly inhabited by man, which are entirely formed of corals,—or, that, far from raising from the depths of the ocean perpendicular walls, these animals form only layers or crusts of a few fathoms thickness. And it is equally impossible to grant to all these animalcules one common impulse, or, as Captain Flinders has it, an instinctive foresight to shelter their habitations from the impetuosity of the winds, by forming constantly high walls and reefs to the windward : a circumstance, the explanation of which we think might easily be sought in physical causes alone. For if the lateral movements of the polypi, or their natural tendency to horizontal construction, happens to be impeded in any one direction, they will gain vertically what they lose horizontally ; and the resistance being equal on the same side, the true horizontal extent will be everywhere the same, and a wall will be formed : while, in an opposite direction, the same circumstances not being in existence, the constructions of the polypi will extend horizontally as well as vertically, and consequently will not rise with the same degree of rapidity as those which are erected to the windward ; and hence

would result an appearance as if this windward bulwark had really been erected by the 'instinctive foresight' of the animalculæ. If the opinion we have thus hazarded be correct, it is evident that, in different situations, there will be coral rocks, exhibiting very different characters; and thus, from the charts given of the coral islands which lie in the Indian and Chinese seas, in the regions of the six months' monsoons, it may be inferred that every side is equally advanced in formation. Chamisso says, that the larger species of coral insects, which form blocks measuring several fathoms in thickness, seem to prefer the violent surf on the external edge of the reef; which, with the obstacles opposed to the continuation of their life in the middle of a broad reef, by the amassing of shells and fragments of coral, easily account for the outer edge of the reef first approaching the surface; and the same circumstances must also contribute to the circular character of these reefs, or groups of reefs. Whether those islands, which have greater length than breadth, are opposed in their greatest extent to the winds and waves, appears to depend on the size and arrangement of their submarine supports. The arguments of Quoy and Gaimard, who say that the species which form the most considerable banks, such as the *Meandrinæ*, certain *Caryophyllæ*, and especially the *Astreæ*, require the influence of light to perfect them, and consequently cannot be developed at a depth of from ten to twelve hundred feet, are only applicable to those species; and if the species of the genus *Astrea* are alone capable of covering immense extents of surface, and do not commence their operations at a greater depth than twenty-five or thirty feet, why may not the branched madrepores, which do live at considerable depths, have formed the platform for their reception, just as we see the marine algæ distributed in different zones or depths of the sea *?

In the uncultivated tracts of our latitude, vegetation generally commences by the appearance of pulverulent lichens, which are succeeded by foliaceous plants of a more perfect organization, by mosses, and finally, varying with the soil and situation, by monocotyledonous or dicotyledonous plants, which gradually make their appearance; but the coral islands of the Pacific, not adapted to support plants requiring a depth of soil, often first afford a basis to high trees provided with fibrous roots, as the *Pisonia*, *Cordia Sebastiania*, *Morinda citrifolia*, and *Pandanus odoratissimus*, which, at a distance, give to these small islands the form of a hill. The loose dry stones of the first ridge are penetrated by the hard roots of the *Tifano*, which expands its branches into a tall, spreading tree, and is attended by the fragrant *Suriana*, and the sweet-scented *Tournefortia*, in the shelter of whose foliage the *Achyranthus* and *Lepidium* seem to thrive the best. Beyond the first

* Captain Beechey informed Mr. Lyell, that in Ducies Island, W. Long. 120°, he ascertained that the corals were growing at the depth of one hundred and eighty feet.—*Lyell's Geology*, p. 120.

high and stony ridge, the hardy *Scaevola* extends in creeping roots and procumbent verdure towards the sea, throwing its succulent leaves round the sharp coral stones. The gradual developement of vegetation, and succession of species and families, on these virgin islands, would form a subject for investigation of very considerable interest.

It is well known that Bory St. Vincent attempted a classification or geographical distribution of seas, founded upon their natural productions and natural phenomena. A system of this kind, when applied to mediterranean waters, assumed a still greater interest from the new light which it threw upon the changes which animal and vegetable forms undergo, from changes in the physical characters of the medium in which they live, and which promised to open a new field for speculation to geologists. In the wide ocean, however, where the marine productions were few, and those sometimes not well characterized, it was necessary to have recourse to the geographical distribution of the birds and animals that frequented its waters and coasts, as the vegetation of mediterranean shores lent its evidence in tracing affinity or dissimilarity between seas separated by slight geographical distances. In the narrative of Captain Beechey's voyage we find many facts of interest in a study of this kind, the most remarkable of which we shall briefly enumerate. As the Blossom approached the Falkland Islands from Rio Janeiro, some penguins were seen upon the water in latitude 47° S., at a distance of 340 miles from the nearest land,—a fact which either proves the common opinion, that this species never strays far from land, to be an error, or that some unknown land exists in the vicinity. Off the river Plate, they fell in with the dusky albatross (*Diomedea fuliginosa*), which on reaching the latitude of 51° S. quitted them; but on rounding the Cape, and regaining the same parallel of 51° S. on the opposite side, the same bird again came round, and accompanied the ship up the Chili coast. The pintados were their constant attendants the whole way. In the Bay of Concepcion, shags were observed sometimes to fly in an unbroken line of two miles and more in length. The pintados deserted the ship the day after they had left the coast of Chili. In the lagoons of the coral reefs, abundance of beautifully coloured fish, of the genera *Chaetodon* *Sparus* and *Gymnothorax*, were observed. *Echini* were not abundant, but *Aphroditæ*, *Halothuriæ*, *Asteriæ*, &c.

The shell-fish belonged to our own genera. *Helix*, (!) *arca*, *ostrea*, *cardium*, *turbo*, *venus*, *cyprea*, *voluta*, *harpa*, *haliotis*, *patella*, are among those enumerated.

In this dangerous Archipelago birds are seldom fallacious indicators of land. They range about forty miles from the islands, and consist principally of black and white tern. To the W.N.W.

of Sandwich Islands, they first observed the albatross. Captain King, on his passage to Kamtschatka, first met these birds within twenty miles of the same spot. In the same latitudes, the species of flying fish was changed. In 33° N. the first birds of the northern regions were met with. These were the *Procellaria puffinus*. The tropical birds accompanied them as far as 36° N. In 35° N. the sea became covered with beroes, nereis, and other molluscous animals, and small crustacea. Captain Beechey says that the vicinity of the St. Lawrence Islands, in Beering's Straits, is always indicated by the crested auk (*Alca cristatella*). The dredge off this island furnished specimens of genera which exist in great abundance on our coasts. The same remark is applicable to the vegetation of the shores of Beering's Straits and Kotzebue's Sound, and this is nowhere more remarkable than in Cape Espenberg.

We notice these few facts, furnished by Captain Beechey's voyage, not to prove that the respective position of any place on the globe has any exact and positive relation with its aquatic or terrestrial productions. But although these do not stop at such or such an arch of the sphere, and we cannot perhaps quote a single animal or vegetable which first makes its appearance at such or such a degree of latitude or longitude; yet all natural productions have their zones more or less large and sinuous; and with the progress of science, we shall find the manner in which the principal marine and littoral productions are distributed over the immensity of the waters will enable us to obtain grounds for the most natural divisions of their surface.

The altitudes obtained by barometrical or trigonometrical observations attach themselves peculiarly to physical geography, as illustrating the height of continents, of mountain chains, and of culminating points, which, however, are more often objects of curiosity than of scientific interest. The barometrical measurements were computed according to Mr. Daniell's method; and the heights ascertained at sea were with sextants, patent log-bases, and astronomical bearings.

Rio de Janeiro ..	Corcovado	2308	Barometer..	1825
"	"	2296	Ditto	1828
"	"	2306	Trig. m. ...	1825
"	"	2306	Ditto	1828
"	Sugar-loaf	1285	Ditto	1825
"	"	1299	Ditto	1828
Conception	N. Pap. Bio Bio...	789.6	Ditto	
"	Observatory	78	Dip of the sea.	
Pitcairn Island...	Peak on it	1046.5	Trig. m.	
Gambier Island..	{ Highest Peak of Mt. Duff	1247.9	Ditto.	
"	Ship Rock	441.1	Ditto.	

Miatea	Peak on it	1432.3	Trig. m.
Beering's Strait..	Cape Lisburn	849	Dip of the sea.
Kotzebue Sound..	Chamisso Island	231	Ditto.
"	{ Hill N. of Spafarief } Bay	616	Ditto.
Society Islands ..	{ Peak with a hole } (Eimeo).....	404.1	Trig. m.
San Francisco...	Angel Island	900.7	Barometer.
"	Deviation (Balbones)	378.3	Trig. m.
"	Yerba Buena Island	513.8	Ditto.
"	{ Hill at Yerba Buena } Cove	467.2	Ditto.
Island of Assump- tion, Ladrões.	{ Summit of the Cone	2096	Ditto.
Botel Tobago Xima	Peak at W. Angle ..	1817	Base at sea.
"	Peak at N.E. Angle exceeded this altitude by about 30 feet.		
Loo Choo	Onnodake Mount ...	1089	Trig. m.
"	Abbey Point	98.4	Dip of the horizon.
"	Kumi Head	99.8	Ditto.
Petropaulski	{ Villeuchinski (Sugar- Loaf)	7374	Trig. m.
"	{ Avatcha Mountain, N. by E. of the town	{ 1149.1 1161.2 1149.6 }	Trig. operation on shore.
Cape Lisburn...	Flint Station	849.3	Dip of the horizon.
Kotzebue Sound .	{ Hill N. of Spafarief } Bay	616	Ditto.
"	Chamisso Island	231	Ditto.
Port Clarence ...	High Snowy Mountain	2596	Trig. m.
San Blas	Commandant's House	141	Dip of the horizon.
"	San Juan Paps.	{ 6216 } { 6230 }	Trig. m.
Calima Mount		1200.3	Ditto.

FOSSIL BONES.—The supposed discovery of fossil bones imbedded in the ice of Escholtz Bay, in West Georgia, had excited much interest among naturalists, both on account of the antiquity which it gave to ice formations, and the light which such a discovery was calculated to throw on the state of the climate of the arctic regions at the time when they were thickly inhabited by genera of the largest quadrupeds. But (as before observed) the visit of the Blossom to these shores has demonstrated that the supposed ice formation is only a casing occurring on the face of a cliff, of from twenty to eighty feet in height, and rising inland to a rounded range of hills, between four and five hundred feet above the sea. The geognostic structure of these cliffs is a bluish-coloured mud or clay, corresponding in character to our

diluvium; and the glacial facing, which was easily cut through, appeared to Captain Beechey to be occasioned either by the snow being banked up against the cliff or collected in its hollows in the winter, and converted into ice in the summer by partial thawings and freezings, or by the constant flow of water during the summer over the edges of the cliffs, on which, when converted into ice, the sun's rays operate less forcibly than on other parts. At Blossom Cape, in Kotzebue Bay, the ice, instead of merely forming a shield to the cliff, was imbedded in the indentations along its edges, filling them up nearly even with the point.

The bones found in this deposit of mud and gravel belonged to the elephant, the urus, the deer, and the horse. Some of the tusks examined by Professor Buckland possessed the same double curvature as the tusks of the great elephant in the museum at Petersburg, from the icy cliff at the mouth of the Lena, in Siberia. The head of the musk-ox, brought home with the fossil bones, Professor Buckland says, cannot be considered as fossil. The horns of the deer were similar to those found in the *diluvium* of England; but there were also the cervical vertebræ of an unknown animal, and which must have differed essentially from any that now inhabit the polar regions of the northern hemisphere.

II.—*A Narrative of a Visit to the Court of Sinde, &c.* By James Burnes, Surgeon to the Residency at Bhooj. Bombay. 1829. Edinburgh. 1831. By W. Ainsworth, Esq.

SIND, or Sinde, extends on both sides of the river Indus, called by the Hindoos Sindh, which thus gives its name to the country. It resembles Egypt in the overflowing of the river, in its climate, in some degree in its soil, and also in being confined on one side by a ridge of mountains, and on the other by a desert. Being of classical celebrity, it has long attracted the attention of geographers; but from the opposition offered to research by the prejudices of its oriental possessors, and the predatory habits of its Nomadic tribes, it has remained until very lately quite unexplored. The views of Napoleon, however, on our Indian possessions, first pointed out the necessity of a better acquaintance with a country which forms their western barrier; and we are indebted to the impulse given by these precautionary measures for Colonel Pottinger's account of Sinde, and his subsequent exploration, with Captain Christie, of Belochistan, and a part of Persia. The final occupation of Cutch by the British troops in 1819, further brought our government in connexion with Sinde; and after an unsuccessful

embassy in 1820, finally led to Mr. James Burnes, surgeon to the Residency at Bhooj, and author of the work before us, being called to the court of Hyderabad in his medical capacity.

Previous to the publication of Mr. Burnes's work, which only took place in this country two years after its publication at Bombay, the reports of Mr. Crow, sometime resident at Tattah, and of Messrs. Seton and Ellis, had furnished us with much that was new relative to the history and resources of this country; and it is to be regretted, as these memoirs are not accessible to the public, that our author did not incorporate more of their details in his own narrative. As, however, so little has hitherto been published on this interesting country, we shall, in analysing the result of Mr. Burnes's observations, draw also from other authorities, more especially the excellent work of Colonel Pottinger; and thus present a sort of digest of what is at present known of the state and condition of Sind.

Unlike most countries situate on the banks of large rivers, the plains adjoining the Indus have, in no period of their history, attained a very high degree of agricultural or commercial wealth; nor have their inhabitants ever occupied a situation high in the scale of civilization and political power. This is to be attributed first to physical causes, and afterwards to the moral consequences of those which have, as usual, co-operated with them. In the immediate neighbourhood of a mighty river there is a dearth of fresh water, and hence Nomadic tribes and temporary residences. The uncertain sway of its possessors thus gave origin to internal discussions and predatory habits; and the want of imposing institutions, and of exact and severe discipline, entailed their bad effects on society, and prevented its ever arriving at maturity. Science and literature were neglected; arts and agriculture remained consequently stationary; while, for ages, fanaticism and superstition, prejudice and despotism, have united in overwhelming the industry and latent enterprise of the inhabitants.

The physical characters of Sind are not, however, quite uniform;—some parts appear to have been but lately claimed from the ocean, and exhibit abundant remains of decayed shells and other marine productions, as in the vicinity of Luckput, though we have not sufficient data to determine whether its saline steppes, which here constitute the desert part of the province, are or are not of modern formation. At Kutree, the landing place on crossing the Lloonee branch, there is neither house nor inhabitants, nor even the usual party of soldiers for the collection of the revenue; the country around is equally without trees, and the road, in the rainy season, impassable, though, at other times, firm and hard. The country around Kurrachee, at the south-western extremity, is also a perfect level: and after dry weather, with the exception of

afew shrubs, has no vegetation ; but in forty-eight hours after rain, it becomes a perfect grass-plat. The country between Kurrachee and Tattah continues in the same level, and is, in like manner, alternately a wilderness or desert. On the south-eastern side of the Indus the country preserves everywhere pretty nearly the same aspect, being, at Lah, a dead, unproductive flat, sometimes interspersed with scattered and stunted shrubs. Near Hyderabad it becomes more hilly ; and, from Ruree to Dhurra, canals are dug for the purposes of agriculture from the branches of the Indus ; and over many of them small brick bridges are thrown, on which apparatuses for drawing water are constantly at work for irrigating the fields. The extensive cultivation and richness of the soil are here, too, remarkable ; but from Laiqpoor to Bunna, and from thence to within a short distance of Hyderabad, the whole is converted, by a most selfish policy, into hunting forests for the Ameers. The vegetation of the uncultivated tracts is almost entirely confined to shrubs of the Lye, or tamarisk ; the babool (*Mimosa Arabica*), taghuz, a tamarisk with white bark and leaves ; the doodhill (*Euphorbia antiquorum*), the Kurbo aleander, or almond flower ; the shinz (*Hedysarum Alhagi*) ; and the trees which cluster round a brackish water are the Peepul (*Ficus religiosa*), Neem (*Melia agadirachta*), and the Guz, or Indian tamarisk.

The villages of Sind are inferior even to those of Cutch. They are, for the most part, collections of low huts composed entirely of clay and thatch ; while even the mosques with which they abound are generally of the same frail materials, and only distinguishable by their greater elevation, and a feeble attempt at ornament. Many of the inhabitants live in grass hovels in the field which they cultivate. Most of the villages have no name except that of their actual owner ; and it is not unusual for the whole population of a place to remove their dwellings to another station, as inclination or necessity prompts them, and when either food or forage fails. These villages are, in reality, mere stations in the desert, where a little brackish water can be obtained. Tattah, formerly the capital of Sind, and one of the richest cities in Asia, is still nearly six miles in circumference, exclusive of the ruins which extend a long way on both sides. The population, at the time Colonel Pottinger visited it, amounted to near 20,000 souls,—and Mr. Burnes gives double that amount ; but its sheds consist chiefly of ruinous and uninhabited houses, the walls being built hollow by means of a frame of wood, plastered over with mud or mortar ; and this, it is probable, Mr. Burnes mistook for stone, which he mentions as used in the construction of Tattah. All the houses have badgeers, or ventilators, like chimneys.

The Sindians are mostly tall, with good features, and well-formed limbs. Their complexions are dark, but the beauty of the

women is proverbial. The men are a strong and healthy race, though more fitted for fatigue than activity. Rotundity is the mark of greatness, and considered as a beauty; prescriptions for increasing bulk are in much esteem. Many of the Belooch chiefs and officers of their court are too large for the dimensions of any European chair. Under a government where extortion, ignorance, and tyranny are, perhaps, unequalled in the world, they are avaricious, full of deceit, cruel, ungrateful, proud, impatient, knavish, mean, fanatical, and superstitious. According to Crow, they have no zeal but for the propagation of their religious faith; no spirit but in celebrating the Eed; no liberality but in feeding lazy Seyuds; and no taste but in ornamenting old tombs. Their good qualities appear to consist in personal bravery, abstinence, capability of making great exertions, and unqualified submission. They are not regardless either, nor deficient in fidelity and hospitality, which latter is probably imposed upon them by their religion. And their mental energies and natural faculties also appear good.

Their active diversions are shooting and clapping with their swords. They are good marksmen with their matchlocks, and inimitably dexterous with their bows and a blunt heavy arrow which they use for game, and dart in a transverse instead of a straight direction, so that the body, and not the point of the arrow, strikes the object. With these arrows they kill partridges flying to the right and left, as expeditiously as any European sportsman with a double-barrelled gun.

The courtiers and soldiery are addicted to the use of opium and blumg (*Cannabis sativa*); great quantities of assafoetida are also used by them as food. The Ameers are, however, much less sunk in sensuality and indulgence than most Mahomedan princes; and, according to Dr. Burnes, they never indulge in intoxicating drugs and liquors.

The Ameers and their attendants are dressed nearly alike, in Angricas or tunics of fine white muslin, neatly prepared and plaited so as to resemble dimity, with cummerbunds or sashes of silk and gold, wide Turkish trowsers of silk tied at the ankle, chiefly dark blue, and cylindrical caps made of gold brocade or embroidered velvet. With the exception of the Cashmere shawls and the loongees or sashes, which are made at Tattah, the cloths worn are generally of European manufacture. Longees are made for sashes, turbans, &c.; some are of silk, others of silk and cotton, and many of them are exceedingly rich and costly, with much gold embroidery. During the cold season the muslin tunics are laid aside, and the Ameers wear robes or cloaks made of the most valuable description of Cashmere shawls, gorgeously embroidered with gold lace, and lined with the black fur of Candahar. Sometimes the apparel consists of European damask silks or

satin, lined with some warmer material, and quilted with cotton. Meer Mahommed wore a surcoat of flowered pink satin. The turbans worn by the great men of Sinde contain some of them upwards of eighty yards in length of gauze, and are from two to three and a half feet in diameter.

The brilliant collection of jewels and armour in the possession of the Ameers of Sinde is calculated to excite the surprise of a stranger. They adorn their daggers, swords, and matchlocks with rubies, diamonds, pearls, and emeralds, many of which they wear as rings and clasps in different parts of their dress. Colonel Pottinger mentions an emerald larger than a pigeon's egg, and Dr. Burnes alludes to one which was cut in the shape of a parroquet as large as life. Their sword-blades are extremely valuable, and worth sometimes, even when plain and unornamented, half a lac of rupees. One which was presented to Dr. Burnes by Kurim Ali bore the Mahommedan date, 1122 (A.D. 1708), and was valued in Sinde at two thousand rupees. The armoury of their highnesses is graced with swords which have been worn by almost every prince renowned in Asiatic story. Their swords do not appear heavier than common English sabres, but are differently balanced; and the above-mentioned gentleman saw one of the young princes with a single stroke cut a large sheep in two.

In their religious creed the Sindians, like the Beloches, are generally Soonees. The family of the Ameers is very religious. The Talpoors were also originally Soonees, but their connexion with Persia has infected the court with the doctrines of that kingdom, and, with the exception of Mourad Ali and Sobdar, they have become Sheahs or followers of Ali. The two faiths, it is said, cannot exist in concord, though, according to Sir John Malcolm, the difference consists more in matter of opinion than practice; and Pottinger says, that it would be more dangerous to appear in Belochistan as a Scheah than even as a Christian. Religious toleration is not a virtue of the Sinde government. The Hindoos suffer many indignities, and are forced to wear the Mahommedan dress and to wear beards; few are allowed the privilege of riding horses or of having saddles; and circumcision is performed upon them on the slightest pretences. The Seyuds, or descendants of the prophet, are looked upon with the most unbounded and superstitious respect. Faqueers, or religious mendicants, infest the public highways at Hyderabad, demanding alms in tones of overbearing insolence. They also sound horns and trumpets, and continued near the British envoy's tent, in the mission of Mr. Smith, for days at a time.

The system of jurisprudence is taken from the Koran. The Hindoos mostly settle their differences among themselves by punchaets or arbitration, without a reference to ruling authorities.

The Beloches seem generally to take the law into their own hands, and to act on the simple principle of retaliation. The Ameers only interfere when the disputes assume a serious character, or extend to whole tribes.

The exports from Sind or home produce are saltpetre, salt, rice, cotton, ghee oil, oil seed, sharks' fins, bark for tanning, alkali, calico, and felts; and from the kingdoms and provinces to the northward they bring, chiefly for exportation, assafœtida, saffron, horses, leather, hides, madder, musk, alum, drugs of various kinds, Cashmere shawls, dried fruit, diamonds, lapis lazuli, turquoises, and other precious stones, bdellium, and gums. The imports from India are iron, tin, steel, lead, copper, ivory, tea, sugar, spices of all descriptions, chintz, broad-cloth, glass, china ware, cocoa nuts, indigo, areca nuts, muslin, gold cloth, shields, &c. &c. From Khorosan, Persia, and Arabia, the Sindians have for home consumption swords, silk, carpets, dates, rose-water, conserve, tobacco, coffee, and kullyans. Horses are brought in great numbers annually from Kaboul and Candahar to Cutch and Bombay, where they are bought by agents for the British government; but the Beloch soldiers are not well mounted; and except in the stables of the Ameers, there are no fine horses to be seen. The Ameers also keep an immense number of dogs of good breed. The camels of Sind, which are so famed throughout the whole of Asia, are reared all along the delta of the Indus. They are the only species of conveyance used in the country; and there can be no doubt that their superiority is to be attributed to the saline nature of their food, which has also been found to ameliorate the breed in other animals.

The manufactures of the country have been very extensive, but are dwindling away. The fanciful taste of the Ameers and courtiers for swords and jewellery affords an occupation to a considerable number of workmen at Hyderabad; but the weavers of calico and loongees are no longer so numerous as they were in former times. At the visit of Nadir Shah it is said that they were at Tattah forty thousand weavers, and artisans of every description, to the number of twenty thousand more, exclusive of bankers, money-changers, shopkeepers, and sellers of grain, who were estimated at sixty thousand. The principal manufactures of Hyderabad are now of various kinds of arms, such as spears, matchlocks, swords, and of embroidered cloths. There must be considerable activity on the Indus, even in the present day, for Burnes says, that above Bunna, where it is nearly a mile broad, it was studded with boats, filling its channel from bank to bank.

The Sindian soldiers, or military retainers of the Ameers, are dressed in frocks resembling those of English labourers, of a coarse

dark blue cotton; trowsers of the same material, and the national cap, which is of a cylindrical form, about eight inches in height, and commonly made of coloured cloth. Like their countrymen in general, they wear long beards and mustachios, and are armed with swords, daggers, matchlocks, and shields. With the exception of a small corps of Beloches, who are kept to garrison the fortress of Hyderabad, the armed retainers of the Ameers are few in number and contemptible in appearance. The government, it is said, could assemble about forty thousand men in the course of a few days, by some means resembling the red cross of our own forefathers, they being at other times employed in agriculture and other peaceful occupations. The military classes of the subjects of the Ameers may be considered as a body of marauders ready to take arms for any cause which will afford them support, or which offers a prospect of plunder. In the field, though brave and hardy, the Sindian soldier has no discipline, and their vanity and boasting are excessive.

The few walled towns in the province of Sinde are contemptible, and scarcely deserve the name of fortresses. Omerhote, the repository of the wealth of the Ameers, is within a few miles of a branch of the Indus, and utterly untenable. The fortifications of Kurachee, the principal port, are mean and irregular; the houses within the walls amounted, in 1813, to three thousand two hundred and fifty; but the population did not amount to thirteen thousand souls. The city of Hyderabad is a collection of houses of very poor appearance, according to one author, wretched low mud hovels. The fortifications consist of a high wall and citadel; the latter is entirely brick-work, but very thick; the figure circular, and not more than a hundred yards in diameter; the walls are gradually crumbling away.

The general style of the court of Sinde excited the admiration of the travellers; and Dr. Burnes says, there was an air of dignity and good breeding in the younger princes seldom to be met with either in the European or native characters. After the second visit of this gentleman to the court, the ceremony of taking off the shoes was dispensed with. The Ameers pay visits to the Shikargahs, or preserves for game, once or twice a month. These are large tracts of jungle so carefully inclosed as to prevent the egress of all quadrupeds; and the walls being closed up, the game is hunted till dire necessity obliges it to seek for water in a well, near a temporary building or wicker bungalow, which is placed in gardens beautifully shaded and decked with flowers, and from which the Ameers shoot the animals deliberately, and receive the acclamations of their followers. They are also extremely fond of hawks; and all the *grandees* in Sinde, when they appear in public, are attended by

sheir bazbans or falconers, with hawks, some of which are of great value. The best are brought from Turkistan and the northern parts of Cabul.

The princes show their distrust of one another in nothing so much as in never leaving any of their number behind on a hunting excursion; great precautions are also taken to prevent treachery or combination against themselves. Like all Asiatic governors, they never sacrifice present gains for future advantages; nor do they consider the interests of the people and their rulers as the same. Their internal policy is directed towards the accumulation of wealth, on which they consider the grandeur and stability of their dynasty to depend. The enormous imposts and taxation resulting from this system have the effect of paralysing trade, and trampling down industry. The revenues are farmed to the highest bidders, who only enjoy their contracts by the grace of their masters, and exert, in consequence, to the utmost, during their often brief administration, their powers of exaction and oppression.

The advantage which Sinde has, and which enables her to struggle against the curses of misrule and ignorance, is her independence of periodical rains. The government has no more sympathy with the farmer than the ryot, and is not deaf to appeals against him. The Mussulmen are all soldiers, and rarely leaseholders, and the revenues are thus, for the most part, in the hands of Hindoos who are out of favour at court; and the farmers are not, as is the case in Cutch, civil magistrates. Certainly there is no country adjoining our East India possessions which would better repay the fostering care of a mild and enlightened management than Sinde. The narrow policy of its governors does more to annihilate national prosperity than the whole combination of physical evils; and it is with a feeling entirely independent of a desire for our country's aggrandisement that we would wish to see the Indus once more the seat of a commerce and industry which had been planted there by European hands.

Course of the Indus.—The investigations of late years have rectified many errors regarding the course of the Sindh or Indus, though the charts given by Colonel Pottinger and Mr. Burnes, the latter from a sketch of the Indus, by Samuel Richards, in the Quarter-master-general's office, Bombay, differ considerably in their details; and it appears that, at different periods of the year, the repletion or exsiccation of cross branches gives variable features to that part of the country which is below Bhukor. It is supposed to rise between the 35th and 36th degrees of north latitude, whence it runs a little to the southward of west, for a distance of seven or eight degrees, forcing its way among the snowy mountains that separate Cashmere and Little Thibet. To the fortress of Attock, in latitude 33° 55' N., it varies its course between

south and south-west. To this place it is distinguished by the title of Aboo Seen, or Father River; and beyond this, until joined by the Punjund, or five streams, it is usually called the Roode Attock;—from this point it is exclusively spoken of as the Duryaé Sinde, or Sea of Sinde. It flows south-south-west, almost without a curve, until seventeen miles below Bhukor;—it sends off a branch called Kumburgundee and Larkhanu River, which expands into a lake at the foot of the Brahoorch Mountains. The district of Chandoohee is fertilized by this branch. Halfway between Bhukor and Sehwan the Indus receives the Khyrpoor, or Doorlee River, to the eastward. The river forms an island of some extent near the fort of Sehwan; and many minor branches disengage themselves from it, which are dry when it is not swollen. The next branch is the Fulelee, which encircles the island on which the capital of Hyderabad is built;—ten miles south-west of the city it re-unites with its mother stream. At its most eastern point it detaches the Goonee, across which Futtah Ali threw an embankment in 1799, and now the fresh water presses against the dam on one side whilst the tide flows up to it on the other. The river below the dam is called the Loonee or Salt River, in contradistinction to the Goonee, which signifies efficacious or useful. After the Fulelee rejoins the Indus, the latter winds a little to the eastward of south, but soon regains its predominant inclination to the south-south-west, which becomes still more westerly after passing Tattah; and, according to Pottinger, enters the Indian Ocean in one vast body; but Mr. Burnes navigated two large arms below the last-mentioned place, called the Meyraum and Buggaur, which latter river the same author seems inclined to think is the branch navigated by Alexander, who would then have passed the Luckput Creek; and it is not impossible that Pattala, of whose identity with Tattah, or Hyderabad, even Colonel Pottinger seems very doubtful, is where the modern town of Jerk is placed; in which case the Macedonian conqueror may have navigated the Punjaree branch which passes by Laikpoor and Meerpore, which would also have brought him to the Luckput Creek, though neither of these navigable routes is contained in Colonel Pottinger's map.

The rapidity of the stream in the Indus fluctuates with the seasons, whether dry or otherwise; and the nature of the districts it runs through also seems to affect it. Above Tattah, Pottinger estimates it as usually between two and a half and four miles per hour. The waters are regular in their inundation, in their return, departure, and quantity; beginning to rise about the latter end of April, and subside early in September. The breadth of the swell varies according to the nature of the country through which the river passes. In general, Mr. Crow states that it is felt five miles from the banks on either side, and, in many parts, much more, par-

ticularly in the Delta. The Indus, as a river, has few merits except its periodical swell; its stream is foul and muddy, and so full of shoals and shifting sands that flat-bottomed boats alone are safe, and scarcely any others are used. Its course is extremely crooked, and towards the sea is very inconstant, marks of its caprice abounding in the lower country. Tavernier, who wrote in 1690, says the commerce of Tattah was diminished by the mouth of the river always getting worse, the increasing sand and mud scarcely leaving a passage; and how unfortunate, Burnes truly remarks, it is that no one has left an exact account of the distance of Tattah from the Indus in olden time, or even when Nadir Shah visited Sinde, in 1748. The natives assured Colonel Pottinger that there was no bar at the mouth of the river that would prevent even a line-of-battle ship from going up as high as Lahoree Bunder; but it is very evident that they are totally unacquainted with the quantity of water which such vessels draw. The inconstancy of the Indus itself appears to present an insurmountable obstacle to anything like accuracy in the representation of that river; but of its general features the accounts appear to be as satisfactory as any thing of the kind can possibly be without actual survey.



MISCELLANEOUS, &c.

I. *Papers of the late Mr. William Moorcroft.*

IN December last (1830) a communication was made to the council of the Royal Geographical Society, by Major Archer, a member, recently returned from India, stating that Mr. Moorcroft, the well-known Indian traveller, had, after his examination of Lake Manasawara, as detailed in the Asiatic Researches, penetrated into the Thibetian province of Ladakh, resided some time at its capital, Leh, and thence proceeded to Bokhara, where he died; and as the particulars of this expedition had never yet been published, it was submitted that an examination of whatever correspondence relating to it might be found in the India House, or could be procured on inquiry made in India, could scarcely fail to elicit new and valuable information. And the council having approved of this suggestion, the necessary steps were taken to act on it, and a mass of papers has thus been obtained, of which it may be interesting to members, and to the public, to have some general account. They were supplied by the favour of W. Astell, Esq. late chairman of the Honourable the Court of East India Directors, and W. Stanley Clarke, Esq., a director, to whom Mr. Barrow made the requisite applications; and having been selected from the entire amount of Mr. Moorcroft's correspondence preserved in the Company's records, and in great measure also transcribed by Lieutenant Brand, R.N. (to whom this laborious task was proposed, and who executed it with great zeal, and altogether gratuitously) they have been since revised and arranged by the Honourable Mr. Mounstuart Elphinstone, who has added some explanatory notes where they appeared wanting.

The ostensible object of Mr. Moorcroft's journey was to purchase horses for the Company, with a view as well to improve the breed as to increase the numbers in its stud, of which he was one of the superintendents in Upper India. Besides this, he was to report on the openings which he might meet with for trade amongst a people of whom so little was then, and still is, known. And subordinate to both objects was the determination of positions, and a geographical description of the countries visited. With such a multiplicity of objects before him, his papers are necessarily miscellaneous and of unequal value: yet in selecting from them it has been thought only just to his memory, and to the opportunity thus possessed of examining papers which are not likely in any other way to see the light, not to be too fastidious in the choice; and whatever appeared either new or curious, or in any

way instructive, has been taken. His first route was to Leh, in the neighbourhood of which he arrived in September, 1820; and, after some hesitation and explanations, was admitted into the town. His design was to penetrate thence, through Chinese Thiber, by way of Yarkund, (which, he was given to understand, is the seat of a great fair, resorted to by merchants from all parts of Central Asia,) to Bokhara; and it appears from his correspondence, that for a considerable time he entertained sanguine hopes of being able to effect this. Ultimately, however, he failed, as he thought, through the jealousy of the native, chiefly Cashmerian, merchants, who were afraid of losing their monopoly of communication in this direction, and who encouraged, in consequence, the suspicion with which the Chinese authorities received his applications for permission to pass as a merchant. Struggling with these difficulties, he remained at Leh till September, 1822, extending his influence by successful practice as a surgeon, collecting hearsay information respecting the country wherever he could procure it, and also making, in person, such short excursions within the district of Ladakh as he could obtain permission for from the resident authorities. He then departed for Cashmere, by the ordinary route between the two places, which he represents as being the great channel by which the latter is supplied with the Thibet shawl wool used in its manufactures; but he gives no detailed account of his journey. From Cashmere his purpose was to penetrate to Bokhara by Caubul; but here again he met with great difficulties, and was ultimately detained another year there, to the great dissatisfaction of the Rajah, who was very jealous of him. Early in the year 1824, it is mentioned in a letter from Lord Amherst to the Court of Directors, that he was recalled, with a discretionary power, however, of proceeding, if, before receiving the order, he had penetrated to Caubul; but it is doubtful whether the summons ever reached him. A short memorandum of his death is contained in the correspondence of the Calcutta Government for 1827, stating it to have occurred in March, 1825, at a place called Anghok (presumed to be in Balkh), not at Bokhara, as Major Archer had been informed; nor does it anywhere appear whether he had previously reached Bokhara, or was still on his road to it. None of the papers as yet in the India House relate, indeed, to this latter portion of his journey: the latest despatch from him being dated Cashmere, October, 1823; and a further inquiry, therefore, made in India, either among the government records, or in Balkh, through the medium of native traders, or agents, might yet bring to light some interesting documents.

Those at present possessed by the Society naturally arrange themselves under three heads:—1. The journey to Leh, and account of Ladakh given with it. 2. Such hearsay notices of Chinese Tartary

as were there procured: and, 3. Papers transmitted regarding Cashmere, its soil, productions, manufactures, trade, &c., several of which are very curious and interesting. Selections from each will be published in future volumes of these Transactions, as may be found expedient; and, in the mean time, one extract is subjoined.

Notice on Khoten.

‘ Dated Leh, April 15, 1812.

‘ Marco Polo calls Kotan (Khoten) the principal city of the province of that name. The Chinese general, who conquered the country of Kashgar in 1757, appears to regard it (Khoten) as a place of small consequence; when, in writing to the emperor from the camp before Hashar (Kashgar), he says, “ Je supplie votre Majesté de ne rein exiger cette année de Hortien (Khoten), d’Aksou, de Sailim, de Koutche, et des autres petites villes de ces cantons. Elles sont presqu’entièrement ruinées.”—Mem. tom. i. p. 392. Marsden’s Marco Polo, p. 134.

‘ From information given by a respectable Tooranee merchant, who is acquainted with all the places just mentioned, it appears that Aksou (Aksoo) and its district contain about thirty thousand houses; Sarlien (Saceram) only from two to three hundred; whilst Koutche (Koochar) has about six thousand houses. It is not only possible that the meaning of the Chinese general may have been somewhat strained by the French translator, in causing the former to represent Khoten as one of the small towns in this country; but it is rendered probable by Aksoo and Khoten, districts containing each, upon the lowest calculation, a population greatly exceeding a hundred thousand individuals, being classed in the same rank with Saceram, which contains not more than two thousand inhabitants. But Khoten might have stood in need of repose from taxation after having experienced the presence of a Chinese army as an enemy, when countries visited by one as a friend recover not the effects of its rapaciousness, even within thirty years. It may appear audacious enough, after what has been said by Marco Polo respecting the city of Khoten, much later by the Chinese general, whose opportunities of obtaining local information must have been ample, and even in the present century, by respectable English writers, that I should venture to express a doubt of such a city as Khoten being in existence. But it is not clear that the Venetian traveller did actually visit Khoten. The meaning of the Chinese general may have been perverted, or carelessly expressed by himself; or, accustomed to see cities of immense populousness, he may have considered those of which the inhabitants could not be numbered by laks, as of little importance; and our travellers must have gleaned their information regarding a country so far removed

from the path, under great disadvantage. It is not uncommon for the natives of Asia to call the principal city of a country by the name of the country itself, notwithstanding the former has a different appellation; as, for instance, an inhabitant of Delhi, on being asked the name of his residence, will occasionally answer Hindoostan; and thus the name of Khoten may incidentally have been applied to one of the cities of the country. But setting aside further endeavours to reconcile accounts with facts, I must observe, that my scepticism is founded upon information given by a traveller who has twice visited all the cities of Khoten in the capacity of a merchant, and who asserts that no city of the name of Khoten is now to be found in the country so called; and his testimony is supported by the intelligence procured respecting Khoten from a native of this province in 1812, by Meer Izzut Oollah Khan, at Yarkund, which agrees in all its main points with that related by my informant. If ever a city called Khoten did exist, its name must have been changed, no extraordinary occurrence in China, or it must have been destroyed by some disaster. It is a matter of notoriety to travellers in Khoten, that a large city there is buried under a drift of sand; and my informant speaks positively of this fact, although unacquainted with its name, or with the period or manner in which the event took place. This indifference in an individual, extremely inquisitive and intelligent, is produced in a great measure by the policy of the Chinese government, which punishes severely any person who ventures to dig on the site of the city in search of treasures, and even inquiries are not unattended with risk.

‘Such a catastrophe as the sudden overwhelming of a large city by a sand drift, is no more uncommon in these sandy countries than the overwhelming of cities in Europe, as Herculaneum, Pompeii, &c., by eruptions from a volcano. Meerza Hydur, the cousin of the emperor Babur, and the general of Rasheed Khan, a descendant of Chungiz Khan, reports that Saceram was suddenly buried by a mass of sand.

‘The present cities of Khoten are six in number, viz. Karakash, Elechee, Yoorong-kash, Cheera, Kurreea, and Yungee-kishlak.

‘Karakash, or city of the Black River, so called from being situated upon the banks of this stream, is the first met with on the road from Yarkund, in the direction of east, and at the distance of seven days’ journey. It contains three thousand houses, without numbering those of the district which belongs to it.

‘The second city on the same road, distant from Karakash ten or twelve kos, and likewise to the east, is Elechee, containing about six thousand houses. Two Umbaus, or Chinese residents from Peking, with five hundred troops, are constantly stationed at this

city, which is likewise the head-quarters of the Moosulman governor of that province.

‘ The third city, or Yooroong-kash, the city of the rapid river, is only a kos (mile and a half English, nearly) and a half distant from Elechee to the east, and contains a thousand houses.

‘ Cheera, the fourth city, is situated to the south three days’ journey distant from Yooroong-kash, contains two thousand houses, and its district is particularly famous for the production of silk.

‘ Kurreea, the fifth city, is distant from Cheera four days’ journey, in the direction of south-south-east, and contains four thousand houses.

‘ Yungee-kishlak, the sixth city, is four days’ journey distant from Kurreea, in the direction of south-south-east, and contains a thousand houses. My reporter cannot form any satisfactory estimate of the number of the inhabitants of the districts belonging to the cities. In the mountains there are from three to four hundred houses of shepherds: but by far the greatest proportion of this very numerous class is nomadic, without other habitations than tents. Rating the population of the cities by six persons to each house,—which, from what I have seen of the towns of this country (Ladakh), is rather below than above the average—it will amount to one hundred and two thousand individuals, independently of the inhabitants of the districts.

‘ The road from Yarkund to Karakash is divided into stages, or journeys, of which the following are usually taken by travellers not encumbered by baggage.

From Yarkund to Karakash (Karghalic ?)	20 kos.
„ Karakash to Choulak . . .	5
„ Choulak to Gooma . . .	20
„ Gooma to Moojee . . .	15
„ Moojee to Pialma . . .	20
„ Pialma to Zawa . . .	20
„ Zawa to Karakash . . .	12

112 kos.

‘ But a kafilah can with difficulty make more than ten or twelve kos in a day. At the distance of seven kos from Karakash, on the way to Choulak, the face of the country is covered with a deep fine sand, extremely light, and so subject to shift and to efface all common indications of a road, as to have rendered it necessary to mark its line by a double row of wooden posts, which extend without interruption as far as Karakash.

‘ The greatest length of the country of Khoten is about twelve days’ journey from west to east, its breadth only two days’ journey from south to north.

‘ It is bounded by the mountains of Tibet to the south, by the country of Aksoo to the north, to the west by Yarkund, and to the east by China proper. It is only forty days’ journey from Peking, *but the road is interdicted.*

‘ At eight days’ journey from Yungee-kishlak, in the direction of south-south-east, is a district which abounds with gold in grains and masses, in collecting which five hundred to a thousand men are constantly employed on the part of the Emperor of China. Khoten is supposed to possess this and other metals ; but if the inhabitants be acquainted with any mines, they carefully conceal them from the knowledge of their rulers, lest they should be compelled to work them on the account of the emperor*.

‘ The Dereas Kara, or Black River, contains in its bed pebbles, called in Toorkee, yushm : such stones as are nearly transparent, perfectly white, and free from specks or stains, are highly esteemed in China, and Chinese guards are constantly stationed along the banks of the river to prevent private individuals procuring any, as these jaspers, or agates, formerly an object of commerce, are now reserved for the use of the emperor alone.

‘ The workmen employed in searching for them are compelled every day to take the whole of their prizes to a Chinese officer, specially appointed to examine and select them ; and when a stone of extraordinary bulk and clearness is presented to him, he always welcomes its arrival with a most profound obeisance.

‘ The climate of Khoten is dry and particularly salubrious, the winters are colder, and the summers hotter than those of Ladakh.

‘ The soil, most luxuriantly productive, is very sandy, with water near the surface, well tasted and wholesome. Almost every house is provided with a well. The inhabitants are represented as being generally above the middle size : the males well formed and robust, with agreeable features and complexions of red and white : the females of delicate and elegant forms, and remarkable for the beauty of their eyes, eye-brows, and hair, the latter of which is carefully preserved in the greatest possible luxuriance of growth : and though not confined to their apartments or concealed, they are not subjected to the drudgery of out-door-work, like their Tibuttee neighbours of the same sex. The spinning of cotton affords them much in-door employment, as also the rearing of silk-worms and the winding of the thread ; but the men gather and bring in the leaves of the mulberry for feeding the worms. Marco Polo says, that the people of Khoten are Mahometans ; the translator of

* ‘ At Aksoo there is a mine of rubies which is not worked. Near Eela, a short time ago, a rich vein of silver was discovered accidentally, and information of it was given to the Umbau, or resident, who extracted from it about a thousand Sers for his own use, and then, closing it, forbade its further exploration. Intelligence of this transaction was, however, conveyed to Peking ; and this concealment being a capital crime, the Umbau was poisoned by order of the emperor with a cup of medicated tea.’

Abulghazi also observes, that “*les habitans de la ville font pour la plupart profession du culte de Mahomet*”—Marsden, vol. i, p. 153; and a preceding sentence in the same quotation leads the reader to believe that the Kalmuks formed the smaller part of the population; which is affirmed by Tooranee merchants to have been the case when Khoten was conquered by the Chinese. But the victors deported all the Kalmuks of that country to the cities* of Eela and their districts, in the latter of which their population amounts to about two hundred thousand families, whose residences extend for six days' journey from the cities of Eela in every direction. The breeding of cattle forms the principal employment of the Kalmuks. These are camels, horses, cows, sheep, and goats; and for every hundred head they raise, they pay one to the emperor as a quit-rent.

‘The Kalmuks† bring annually from ten to twenty thousand three-year-old geldings to Eela for sale;—they are ordinarily from thirteen and a half to fourteen hands high, and are sold in droves at about twelve for a yamboo, or ingot of silver, which, at the currency of one hundred and eighty rupees, gives an average of fifteen rupees a horse. These horses are taken to Aksoo, Yarkund, Kashgar, Indejan, Khoten, and even to Bokhara, and resold principally for carrying loads of merchandise.

‘The warlike character and vast numbers of the wandering and widely-spread family of the Kalmuks, which are scattered over a large portion of Russia, Siberia, and China, afford occasional employment to the Chinese government in practising means to prevent their military spirit producing the political aggrandizement of the Kalmuk nation. One expedient is that of dividing their numbers by transporting their masses, by portions, into different parts of the empire when they become formidably great in any one district. The other—and for the honour of human nature one would wish it were an exaggeration—consists in destroying the chief of each horde; for it is asserted, that when the son of a chief attains that age at which his mother transfers him from her care to that of his father, or from ten to fifteen, the latter is always taken off by poison‡ administered by order of the Chinese

* ‘Several cities united to form the city situated on the river of this name.’

† ‘The Kalmuks are employed also as cavalry in the armies of China, and form part of the immense garrison, or standing army, of Eela. The other troops in its cities, composed of Mangoos, of the same family with the emperor, are cavalry armed with swords alone. The Sooloongs are cavalry who use only bows and arrows, and the Karakuthaees are infantry who are alone armed with guns. In former times, by Kuthae was meant (as reported to me) the countries occupied by the Moosulmans on this side of the Great Wall, and by Karakuthae the country within it, but the distinction has now merged in the general term of Kuthae.’

‡ ‘The following is the account given by Mr. Moorcroft's informant of the manner in which this crime is effected. The whole story is chiefly curious as showing the

government, and generally in tea. His son, who succeeds to his rank, deprived of the power of profiting by his father's experience, acquires information only from his own opportunity and energies; and, whatever his mental acquisitions may be, he generally dies before they are communicated to his heir. By this nefarious system the Chinese prevent, as they conceive, the accumulation of much wisdom and experience in any Kalmuk chief, and the risk of its producing the political elevation of the Kalmuk race.

'The Moosulman population of Khoten now, as in the time of Marco Polo, are principally engaged in works of agriculture, manufactures, and commerce, and have little disposition for the profession of arms.

'The domestic animals of the country of Khoten are horses, in great numbers, of a hardy kind, but of a small size. Yaks are bred on the mountains, and common neat cattle on the plains. Sheep of the Doomba, or broad-tailed variety, are reared in vast numbers, but the tails of these are much smaller than those of the Kosak Chief;—their wool is very fine but short, as it is shorn twice a-year.

opinion of the Chinese government entertained by its distant subjects:—"The Kalmuk chief is informed by a message couched in terms most complimentary to his conduct, that his presence at court will be highly gratifying to the emperor; and if the chief plead indisposition, he is allowed to defer his visit to the second year, but no longer. On his arrival at Peking he is received with the greatest attention and respect, is lodged and entertained at the expense of the emperor, speedily introduced to the sovereign, is most graciously noticed and loaded with presents, at least to double the value of those he has offered to the acceptance of the monarch, and after a residence of a stated period, seldom exceeding eight days, has his audience of leave, and departs with some increase of titular honour. At every military station, or corps de garde, on the road of which there are said to be the enormous number of three hundred and sixty between Peking and Yarkund, he is furnished with all the accommodations he and his attendants can stand in need of, and amongst which tea constitutes a never-failing article.

"To some officer of considerable rank the imperial order to administer poison to the unsuspecting Kalmuk has been previously communicated. Its effects, though slow, are sure. So familiar, it would seem, are the Chinese with this instrument of destruction, that its very agents occasionally become its voluntary victims. For when the Chinese governors of places, far removed from the seat of supreme government, have abused their power, and received such an intimation as convinces them that the tribunal to which they are responsible have proof of their delinquency, they, if their crime be of a capital nature, generally prefer the poisoned cup, which preserves their persons from public disgrace, and their property from confiscation, to the risk of losing life, honour, and estates, by the hand of the executioner. I speak here from reports of transactions stated to have occurred on the frontier I am about to approach. After the heir of the Kalmuk chief has performed the funeral duties, he repairs to Eela, and from the Joongjoong, Umbau, or principal Chinese resident, receives the investiture of his late father's office, accompanied by the usual insignia and dresses, along with a donation of ingots of silver, on the part of the emperor, proportioned to his rank and expenses. Gratified by his early elevation, he probably inquires not minutely into its immediate cause, and occupied in the indulgence of those appetites, which for the most part predominate in wealthy and uneducated individuals during the early portion of their lives, he may not feel the impulse of ambition till he nearly reaches that period when its birth and his life are about to be extinguished together."

‘ Shawl-wool goats are not less numerous than sheep, and their fleeces are reported to be at least equal to those of Ladakh.

‘ Wild animals of various kinds are abundant. Camels have two humps; are generally brown, but sometimes of a white colour. They are of a large size, and so swift that men on the horses of the country can seldom overtake them if the camels get a little advantage in the start. They are pursued by hunters as game, their flesh being said to be particularly well flavoured and much relished by the natives. Cloth is made from their wool.

‘ The Goorkhur, or wild ass, is common; as also are many varieties of deer, amongst which is the musk deer, the produce of which is proverbially fine. From a description of the stripes on the skin of a tiger, it would appear that the royal tiger roams on the mountains of Khoten. Leopards and wolves are numerous. Bears are of a yellowish colour, and not very large;—there are no black ones. Foxes, hares, and smaller quadrupeds are in abundance. The large variety of Francolin, which, I believe, has never been described, frequents the summits of the mountains; and the lesser kinds, with partridges and other feathered game, are found in great numbers lower down and near the plains.

‘ Fruit trees of almost all the sorts common in the southern parts of Europe are raised in the gardens of Khoten, as vines which are vastly productive, pomegranates, plums, peaches, apricots, pears, and apples. Melons are of good size, and well flavoured. Wheat, barley, maize, pease, and carrots are cultivated largely; but there is not any rice grown, the soil being too dry for this grain. The few forests existing scarcely deserve the name, there being few timber trees in them, and these are of the same character with those of Ladakh, as poplars and willows; but the mulberry abounds everywhere; and a vast quantity of silk is raised in this province, though a fine white cotton would seem to be its staple produce.

‘ The manufactures of Khoten consist principally of woollen, camlet, cotton, and silk cloths.

‘ The woollens got up in the loom are generally of a thick and coarse texture, or else thin and flimsy, and as yet none of these fabrics approach the nature of European broad cloths. But the felted cloths are large, fine, and well got up. Cotton cloths of a coarse kind are made in vast quantities, both for home use and for exportation. They are sent from every house to Peking in commutation for the capitation-tax, in Toorkee called Alban.

‘ The coin of Khoten is of silver and of copper;—the former, if coin it may properly be called, is in the shape of a boat, with the value stamped in Chinese characters on the concave side; the latter is struck in dies with a hole in the centre of each piece, which is of

low value. Uncoined gold in grains and masses is also a medium of bargain and sale.

‘It is not possible to ascertain or even to make any probable estimate of the amount of the revenue drawn by China from Khoten annually; but there are two direct taxes, viz. the Alban, or poll tax, varying in assessment, as it would seem, according to the age of the individual, but of which I can obtain no classification,—and a second on the produce of the land, from which garden fruits are exempted, as also is silk; but grain of every kind, and cotton, are taken in the proportion of one-tenth of the whole yield for the use of the emperor.

‘Khoten receives from Russia, broad cloths, a fine cloth manufactured at Astrakhan from the wool of the camel foal (of the first year), seal skins and other furs, green velvet, gold and silver thread for embroidery, Bulgar leather, hardware—amongst which are spades or hoes,—logwood, sugar in loaf, and castor,—the latter being used as a medicine for children.

‘Khoten returns to Russia,—but through the intervention of Tooranee traders,—silk cloths, raw silk, and cotton thread.

‘Raw silk, both white and yellow, is first taken to Bokhara, there dyed of various colours, purchased by Nogae traders, and transported across the great Kirghiz steppe to various parts of Russia. No fewer than a thousand camel-loads of undyed cotton thread are said to be also furnished to Russia by Khoten annually.

‘From Bokhara, Khoten receives various commodities, but the principal consists of horses of a large size, of which about five hundred are annually imported.

‘To Bokhara, Khoten sends silk goods, raw silk (although Bokhara itself raises much of this article), and coarse cottons, along with felts.

‘To Yarkund, Indejan, Eela, and Aksoo, Khoten furnishes cotton and silk goods, as well as raw silk and cotton thread. Yarkund also takes off vast quantities of sheep-wool, which is there worked into felts, and, in return, sends rice and cast-iron pots for kitchen use.

‘From Eela and Aksoo, Khoten receives droves of horses bred by the Kalmuks.

‘To Eela alone Khoten sends, yearly, from two to three hundred thousand bales of a coarse cotton cloth like guzzee; the length of each piece is from seven to eight gurz (say yards), the breadth about twelve giruhs, and the *money price* is a rupee. At Eela these cloths are sold to the Kalmuks for money or bartered against cattle. About fifty thousand sheep are annually brought by the Kalmuks to Eela, and the rate of value in exchange adopted is one piece of cotton cloth for a sheep, three for a cow, and six for a horse.

‘ The trade between Hindoostan and Khoten was formerly very extensive; and it is even said, though I presume rather figuratively, that a loaded cart could go all the way from Nugeebad to Sureekee, in the mountains of Khoten. Sureekee is said to be about half way between Yarkund and Karakash, on a road somewhat circuitous, and the following are the stages on the route to it from Yarkund, viz.

Yarkund to Karghalik	20 kos.
Karghalik to Bovera	12
To Cungar	12
Kileean	12
Kathae, or Chinese Choukee* Ourtung	12
Duran Ustee	12
Dereas Kara, the Black River	8
Shaheed Oollah Kojah	12
Sureekee	24

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Sureekee was frequented by the merchants of Hindoostan on account of its quarries of jasper or agate, once much used for drinking cups and ornaments for the person. And although the white marble employed in the mausoleum at Agra and Sekomdra may have been extracted from the neighbourhood of Joudpoor, it is not improbable but that some of the materials for the flower work and tracery may have been brought from the mountains of Khoten†.

* ‘ Choukee is the Hindoostanee and Ourtung the Tartar word for a military or police station.’

† ‘ The road from Sureekee towards Hindoostan is reported to have passed by Rudokh and Gurkh-dokh, but at this latter point information stops. Perhaps the more direct line from Gurkh-dokh to Nugeebad lies across the Neetee Ghat, through Neetee, and probably by Joshee Muth, but I saw not any traces of an ancient road between Neetee and the Pindar river. Having crossed this stream and proceeded one march on our return in 1812, some demonstrations among the Goorkha troops who accompanied us, betrayed an intention to stop us, and this being supported by private communications from the peasantry to me, I determined to take a line of road parallel to that on which we had been previously disposed to go, but some miles distant, though joining it again in a day and a half’s journey.

‘ The object of this deviation was to avoid some narrow paths, through very high grass in low grounds, in which our progress might have been arrested without a favourable opportunity for employing resistance. My companion preferring the old road, I started soon after midnight on the new one, which led over the sides of mountains by a narrow but exposed path, from every point of which much of the adjoining country could be seen.

‘ In the early part of the forenoon I suddenly came upon a road continuous with the path, but much different in character. This road was about six feet in breadth, regularly and substantially paved with small pebbles in some parts, and in others formed of levelled rock. On the right hand the rock was cut up here and there somewhat in the form of a hall, and on the left side of the mountain, for some yards, was gently sloped downwards. In one part two conduits, or pipes, of a harder stone than that of the mountain land, of a different nature, delivered each a small stream of clear and excellent water from the rock into the road for the convenience of travellers. The

' *The Rivers of Khoten.*—The Karakash, Kara Dereas, or Black River (*Kara* meaning *black* in Toorkee, and *Kash*, *river*), proceeds from the mountains of Khoten, flows first from east to west as far as Shaheed, Oollah, Kojah, twenty-four kos, then north for twelve kos, where it receives the Toghreesoo river.

' This stream (which signifies the straight water, *Toghree*, in Toorkee, meaning *straight*, and *Soo*, *water*) takes its rise in the Karhlik Duvan, or Icy mountains (*Karlik*, *place of snow*, and *Duvan*, *mountain*). After this increase it turns to the north-east, and continues in this direction till it reaches the city of Karakash, situated on its left bank. The whole of this distance, or from the source of the river to this city, is about nine days journey.'

' Pursuing its course in the same direction past the city of Yooroongkash, placed on its right bank, and within a quarter of a kos of its stream, in one day's journey more, this river unites with the river of Yooroongkash.

' The Yooroongkash, or rapid river, has its source in the Haringhoo Togh, or *blind* mountain, at three days' journey east from the rise of the Karakash, but in the same chain. It flows in a straight line to the city of Yooroongkash. Its stream is smaller, but more rapid than that of the Karakash, and abounds also with jasper-agates*, which are more highly prized than those of the latter

whole road, which exceeded not a few hundred yards in length, was laid out with judgment, and executed with a solidity that had apparently long braved the influence of the seasons. Beginning abruptly, it ended as suddenly, and as if the last portion had been carried away by an earthslip which had formed a bed for a current. But looking back, I saw, or fancied I saw, its long line sweeping easily across the face of the chain of hills I had skirted. On questioning the peasantry who carried my baggage, respecting the knowledge of this road, they stated that it was called the Badshah's road, and was very ancient.

'Hearing some of them say, that it was the *Rae* or *Rajrah*, and not recollecting that the Rajahs of these mountains had been tributary to the Mogul emperors of Delhi, I told my informers that they probably meant the Rajah's road, to which an intelligent old man observed, that it was not made by any Rajah, but by some Badshah whose name he had never heard. He had heard, he said, that in ancient times much commerce¹ was carried on by it between Hindoostan and some very distant countries. The fragment I allude to is a few kos, as far as my memory serves, to the north-east of the village of Bundalee, which lies, I conceive, to the north-west of the ruined fort of Chandpoor. Perhaps this may have been part of the road to Khoten, and if so, it is presumed not to be improbable that more of its line might be made out by the intelligent and zealous officers employed in surveying that region of the hills.'

* 'A widely spread belief obtains in Asia, that if poison intended for the destruction of man be put into a jasper agate cup, the vessel will fly into pieces, and thus betray the quality of its contents. It is thought by some orientals that liquor drank from a cup of jasper-agate has the power of tranquillizing irregular actions of the heart, especially if aided by rubbing with their vessel the region of this organ, and also the mouth and surrounding parts. It is also reported that any ornament of this material has the quality of diverting from the person of the wearer the stroke of lightning. Absurd as Europeans may consider such attributes, prejudices, sanctioned by antiquity, have great influence on the minds of the inhabitants of the eastern world.'

¹ In regard to the commerce once carried on between Hindoostan and Khoten, see Abulghazis' Evidence, note 310. Mars. Marco Polo; and for the resort of the merchants from Khoten to Delhi, in the reign of Shah Juhan, see the history of that sovereign.

river. The same precautions are adopted on this river as on the Karakash, to prevent the stones being obtained by private persons.

' The river of Yarkund rises from the northern side of the mountains of Kara Korum, opposite to the source of the river Shayook*, on the southern face of the same mountain. On quitting the Kara Korum range, it holds a northerly and straight course for two days' journey to *Ak Togh*, or the white mountain, then south one day's journey to Khafaloon Tushgood, then northerly for two days' journey to Kirghiz Jungul, proceeding in the same direction for six days' journey to Togh-doong-bash, or the lofty mountain; then still north for three days' journey to Koshherul (or between two waters), where it receives the river of Surakol, a tolerably large stream, that rises in the mountain of Chechuklik (or place of flowers, *Chechuk* signifying *flowers*), one day's journey to the west. The river arising from the junction of the two streams at Koshherul, thenceforward takes the name of the Yarkund river, proceeding easterly for eight kos to the town of Post Karn, or Kurn, and retaining this direction for six kos farther, reaches Bish Kint, then goes straight north for five kos, and east five kos, towards Yarkund, which is five kos from the river on the west. From this it continues to pursue an eastern course, and after passing through a woody tract for ten days, mixes its waters with those of the Karakash and Yooroongkash in one common conflux. The name of the river resulting from this triple union is not known to my informant, but it proceeds to the eastward for three days' journey, when it receives the Aksoo river, which comes from the north.

' The Aksoo river rises by several streams, some on the Duvan Borlund (or high mountain) to the north of Toorfan. One is said to arise in the country of the Kirghiz, and another near Eela, each about twelve days' journey in length. They unite at the city of Turfan, or Toorfan Yungee, New Toorfan. The common trunk goes for three days' journey south to Aksoo. From Aksoo, still holding a southern direction for five days' journey, it falls into the river of the three streams of Karakash, Yooroongkash, and Yarkund, but of which the name is not ascertained. The trunk, after this union, proceeds eastward for six days' journey to Bae, a small town; thence still maintaining its

* ' The Chanthan Gurdohk, or Leh river, the long eastern branch of the Indus, receives the Lingtee-Choo, or Zauskur river. at Neema, eight or nine kos to the west, and a little south of Leh, on the road to Kashmeer. The Shayook, a broader river than the common stream of the Leh and Lingtee, unites with this trunk at Khafaloon (not Khafaloon Tushgoon) nine days' journey west of Neema. This Khafaloon is the chief town of the Raj of that name, which has the Raj of Ladakh to the east, and that of Little Tibet to the west, distant three days journey from Baltee, the capital the latter. The state of Khafaloon, of small extent, contains two thousand houses, and about twelve thousand inhabitants.'

eastern course for one or two days' journey reaches Saceram, and onwards for five days' journey more goes to Koocha, thence in ten or twelve days' journey to Karashuhr, the Black City, thence ten or twelve days' journey to Ooroomchoo, thence twelve days' journey to the city of Toorfan, Iskee, or Old Toorfan. Having held an easterly course from Koocha, it maintains the same direction from Iskee, Toorfan, through an uninhabited tract, in some parts mountainous, in others sandy, in others woody, forty days' journey, when it reaches Kamool, a very large city situated in China. The whole of the country through which the river has yet run was formerly under the rule of the Moosulman Rajah or chief of Yarkund, and the population is a mixture of Moosulmans and Chinese.

' From Kamool, the river, continuing its course easterly into China, after twenty days' journey, through a sandy desert, greatly deficient in water, reaches Lunjoo (Lanchen of Marco Polo), a city containing fifty thousand houses. From Lunjoo, still keeping its easterly direction for ten or twelve days' journey, it arrives at Secampoor, a large city, the inhabitants of which are wholly, or almost wholly, Moosulmans, or, as they are there called, Turganee. From Secampoor, going eastward, in twenty days' journey it reaches another large city (Sochen, M. Polo).

' The names of the other cities, or places, visited by this river in the subsequent part of its course in China, are not known to my informant; but he has always understood that it takes a large sweep to the west, and, quitting China, falls into the Irtish. My informant has gone no farther than Aksoo, but a Yarkundee merchant, his friend, who accompanied the Governor, Hakim of Yarkund, to Peking and back, gave him the information which relates to the course of the river in China.

' The preceding information was obtained through inquiries respecting Khoten producing rhubarb, which it does, though not as an article of commerce; and although its materials may stand with little relative connexion, and may present many chasms, I have thought it preferable to submit them in their present form, rather than defer doing it under the hope of make the sketch less imperfect, lest the accidents which may occur in such a journey as is before me may prevent its being done at all.

' If the sources of the Irtish are really to be found in the country appertaining to Yarkund as recited, and that the common stream make the detour described, the Irtish may rank with some of the longest rivers in the world. Whilst my informant confines his relation to circumstances known to himself, I give him full credit for inquiry, observation, and veracity; but suspicions arose in regard to the accuracy of the account given by his friend.

' The retrograde course of such a river, for such a vast distance,

seems in itself little probable; probabilities, however, are of small importance when opposed to the contrary and positive assertion of a respectable reporter. But the placing Lunjoo, as first visited by the river, seems to be an inaccuracy, and fixing Soogoo to the eastward of the former city, is a decided mistake, either of the original reporter or of my informant.

‘The order of the progression of the river may be accounted for by a sweep; but the relative situation of the two cities is an error, as, by observations made by the Jesuits, the portion of Kanchen between See Chew to the west, and Lanchen to the east, is ascertained.

‘Had the reporter stated that, from Kamool, the river had retrograded into the Irkish, the account would have been less open to doubt; but when it is made by him to reach Lanchen, it is much more likely that it should disembody into the Hoango. Having given my doubts, it is only candid to observe, that the Igours, from their original country of Turfan, migrate to the banks of the Irkish. And if the streams of their original country fall into the Irkish, this is easily conceivable.’

II.—*Account of Danish Discoveries on the East Coast of Greenland in 1829.*

THE question respecting the existence of Icelandic colonies on the East coast of Greenland, anterior to the fourteenth century, when they were supposed to have been lost, has long been one of some historical and geographical interest; and although considered by the learned writer of the annexed letter to be now settled, appears still to admit of plausible reasoning on both sides. Of the particulars now given, as bearing on it, the greater number were communicated to the Royal Geographical Society of London, in a letter addressed by Captain Zahrtmann, Hydrographer Royal, Copenhagen, to Captain Beaufort, and read to the Society at its second meeting, in November last. But the following narrative has been preferred, being an official report sent, by order of the Prince of Denmark, to the Geographical Society of Paris, and somewhat more minute:—

‘For some ages back the kings of Denmark have fitted out expeditions from time to time, with a view of re-discovering that part of Greenland which is said to have been formerly peopled by a colony from Iceland, but of which the trace was lost about the end of the fourteenth century. The persons charged with these expeditions have been as follows:—In the reign of Frederick II., Magnus Heinesen; in the reign of Christian IV., Jens Munk, Godske, Lindenou, and Carsten Richardsen; in the reign of

Frederick III., David Danell ; in the reign of Frederick V., Peter Olsen Walloe ; and in the reign of Christian VII., MM. Lowenorn, Egede, and Rothe. But all these attempts were fruitless, so far as concerned the discovery of Greenland to the east of Cape Farewell ; and the only navigator who went so far was M. Valloe, who, by coasting, in the year 1752, arrived at Kangek, in latitude $60^{\circ} 35'$. The other expeditions never succeeded in landing, nor even approached nearer to the shore than the distance of four leagues. It was nearly at that distance that Captain Danell, in 1652, 3d of June, in latitude $64^{\circ} 50'$, discovered two islands, to which he gave the names of Hoidsolen (white sun), and Mastelost Skib (dismasted ship). The 6th of the same month he discovered five other islands situate more to the north.

‘ Under the reign of Frederick VI., distinguished by the encouragement of all the sciences, the search after this lost part of the monarchy was not likely to be forgotten, particularly as the expeditions fitted out for this purpose by the government had been always strongly seconded by the enthusiasm of the people. A commission was nominated to investigate all the difficulties of the enterprise, and the means by which they might be overcome ; and this commission having reported, M. Graah (captain of a frigate), who already during the years 1823 and 1824, had surveyed the west coast of Greenland, between $68^{\circ} 30'$ and 73° of latitude, was appointed to the command of an expedition destined to renew the attempt.

‘ In the spring of the year 1828, he repaired to Greenland with M. Vahl, naturalist, and was there joined by M. Mathiesen, who was to serve him as an interpreter. In the course of this year (1828) and in the establishment of Julianshaab, he organized his expedition, causing to be constructed two konebaades (women’s canoes) and two cajacs, engaging two Greenland men and ten Greenland women, and collecting the provisions and articles of commerce which were likely to be required ; and, having done this, he went to winter at Nenortalik, the establishment nearest to Cape Farewell, and situated at $60^{\circ} 7' 45''$ of north latitude, and $45^{\circ} 23'$ west of Greenwich.

‘ On the 20th of March, 1829, the expedition consisting of four Europeans and twelve natives, embarked in two konebaades, and two cajacs, as already mentioned, and quitted Nenortalik. Instead of doubling the south promontory of Greenland, Kangek-kyrdlex (Statenbuk), situate on an island, they pushed on through the strait which separates that island from the continent, and in this way reached the eastern coast, where their progress was much retarded by masses of ice heaped up in a way that appeared extraordinary even to the Greenlanders. Being thus retarded, the consumption of European provisions was so considerable, compared with their progress, that M. Graah determined to send away the

Europeans, and the least brave of the Greenlanders; and, accompanied by only two Greenland men and four Greenland women, to continue to explore the coast in one only of these frail boats. This separation was effected on the 23d of June, in latitude $61^{\circ} 46' 40''$, and the project, which sufficiently proves the zeal and intrepidity of M. Graah, was crowned with the success which it deserved.

‘ On the 28th of July, he had advanced as far as an island situate in latitude $65^{\circ} 18'$, and $38^{\circ} 27'$ west from Greenwich. He had to contend, in his progress, not only against the ice, which, besides encumbering the navigation and retarding the progress of the canoe, changed even the coast into a glacier, so that the shelter necessary for the men and for the canoe was only to be found at a very few places,—but also against the unwillingness of his crew to run the hazard of being forced to winter on this uninhabited part of the coast, where they would be in danger of famine.

‘ He persevered, however, against every difficulty; but was at last stopped altogether by an insurmountable barrier of ice, and forced to return, after having vainly waited till the end of August, expecting a favourable change. On the 1st of October, he arrived at Nugarbik, latitude $63^{\circ} 22'$, where he took up his winter quarters, and sent home a detail of his enterprise, dated April 2, 1830, entrusting the document to the care of a Greenland, who carried it to the establishment of Julianshaab, from which it was transmitted to Copenhagen. He announces in it his intention to quit Nugarbik on the 3d, to push to the north as far as his limited means would allow, and to return to Nenortalik in the autumn; and it may be hoped that he has since completed his perilous enterprise.

‘ As for the principal object of the expedition, however, it appears to be already accomplished; for having advanced beyond the latitude ascribed to this ancient colony, without discovering the least trace of it, or the most insignificant remains, even in places which must necessarily have been occupied, if the inhabitants had ever possessed fixed habitations,—having found no tradition or trace of the religion, language, or manners of that Christian colony among the natives of the country, it appears evident to M. Graah, that this Icelandic colony could not have been to the east of Statenhuk, but on the south-west part of the present Greenland, near the site of the establishment of Julianshaab, agreeably to the opinion which was expressed forty years ago by M. Eggers, in a work crowned by the Royal Academy of Sciences at Copenhagen.

‘ A chart, transmitted by M. Graah, differs materially from those that have been constructed after the old description of the bishopric of Greenland, by Ivar Bardsen; but it confirms the

discoveries of Captain Danell, for not only does it show the islands of Hoidsolen and Mastelost Skib, but M. Graah has even discovered from the point whence he returned, three of the five islands of Danell. The only circumstance which appears to favour the old opinion respecting the situation of that colony, is the physical character of the men whom M. Graah has found there. They have little analogy with the Esquimaux, and resemble, on the contrary, the Scandinavians of Europe. They have neither the flat heads, short broad persons, nor the flabby fatness of the Esquimaux, but are for the most part above the middle stature, having the European form of head and expression of countenance. Their persons are rather meagre, but nervous, and finely formed, without any appearance of weakness; and they are more active and robust than the inhabitants of the west coast. The colour of the skin of the women and children is quite as clear and pure as that of Europeans, and they have often brown hair, which is never seen on the other inhabitants of Greenland. Some of their men allow their mustachios to grow, others tattoo their arms, and all the women have their arms, hands, and chin tattooed—an operation which they execute themselves. Exposed to the greatest physical suffering, and very often to famine, it is seldom that they live beyond the age of fifty; it is also alleged that the population is decreasing; and between the latitudes of 60° and 65° , M. Graah found only about five or six hundred inhabitants. The population appeared to have decreased on the south side of the coast, some of the inhabitants having emigrated to a new mission of Moravian Brothers, which has lately established itself at Fredrichsthal, near to Cape Statenhuk. The missionaries are accustomed to collect the natives around them, and this facilitates, doubtless, their instruction and conversion; while, on the other hand, it increases the ravages of famine when the harvest fails. In the establishments of the Danish missionaries, they prefer to allow the natives to pursue their wandering life, but without losing sight of the object of the mission.

‘With respect to their religious opinions, it is a subject on which M. Graah does not enter into any detail, on account of his imperfect knowledge of their language. It appears that, like the other Greenlanders, they adore two beings, a good and an evil deity. Like them, too, they have sorcerers (*angedokks*), but their influence does not appear to be so great, and is probably diminishing still more, because M. Graah observed, that the young people amused themselves with laughing at them. In their moral character they seem very estimable; and the reported good-nature of the husbands, the submission of their wives, the obedience of the children, and the mutual affection and confidence of the whole community, make it difficult to remember that they are pagans. It was the good faith, the hospitality, the kind and generous dispo-

sitions of these children of nature, that enabled M. Graah, in his isolated situation, to overcome the obstacles by which he was surrounded. During thirteen months he lost only a hatchet, and this he believed that he had forgotten somewhere; and his letters and journals have been transmitted to us by a Greenlander, who carried them from Nugarbik to Nenalalek. Polygamy is not common among them; they do not change their wives, and their morals appear to be irreproachable. The married people neither fight nor dispute with one another, and no appearance of ill-humour is to be seen among them.

‘ Although M. Graah possessed articles that greatly delighted them, no Greenlander, not even one of the children, begged for anything, unless when service had been rendered; for on these occasions they always demanded a gratification, but were generally satisfied with a portion of tobacco. Their chief luxuries are tobacco, coffee, and eau de vie.

‘ All this coast appears to be still colder, more barren and miserable than the west coast. It may be said to consist of one uninterrupted glacier (*gisbrae*), exhibiting only a few patches of vegetation, generally on the banks of the rivers—and elsewhere, often advancing far into the sea, and forming promontories of ice, which are passed with so much the more danger, that they frequently fall in avalanches (*koeloe*).

‘ During the whole summer of 1829, there was not one day which could be called warm; and before the 14th of June, the Centigrade thermometer had never risen above 12° . During the winter of 1828-9, however, the cold never exceeded -17° or 18° ; and the south-west winds sometimes caused the temperature to rise suddenly to $+13^{\circ}$.

‘ At Ekolumius, latitude $63^{\circ} 30'$, the vegetation appeared to M. Graah to be superior to that of any other part of the coast, even of Julianshaab, which is reputed to be the most favoured part of the west coast. This vegetation, however, appears to consist only in a fine grass, which withers quickly when exposed to the warmth of the sun, and in some anti-scorbutic plants, as sorrel and scurvy-grass, with one or two kinds of flowers, and low bushes of willow and birch, of which the maximum growth is two feet.

‘ The food of the natives is principally the dried flesh of the seal, with a little game and fish. M. Graah makes mention of bears, hares, birds, and salmon; but he says that, even at the latitude of $63^{\circ} 36'$, rein-deer and hares are known only by name.

‘ In laying down the plan of the coast, M. Graah derived no assistance from his chronometers, because one of them stopped at Nenortalik, and the other at the beginning of the voyage, which was of a nature to expose these delicate instruments to too much casualty.

‘ He made many observations of latitude and some of lunar dis-

tances, as well as of the declination of the needle ; and in the latitude of $63^{\circ} 11' 12''$, he found an excellent harbour, Amitoarsuk, which he has surveyed, but the details and many of the results have not arrived, the extract from his journals containing only a few latitudes and a single longitude taken by lunar distances. At the bottom of a bay, latitude $61^{\circ} 10'$, he found a three-pound iron gun, of what country could not be ascertained, but which seems to date from the end of the seventeenth century, and has probably belonged to a whale-ship that was lost. At $63^{\circ} 36'$ of latitude, the natives pretend to have seen, about the end of July, 1829, a ship in the open sea, *at a very great distance*; it would be interesting to know if, at that time, any whaler attempted to pass between Iceland and Greenland, and in what state it found the ice. The last inhabitants whom M. Graah found on that coast informed him, that he would find others still farther north, and but a little way off. It is to be hoped, therefore, that he has since reached them, and that he will in this way procure us further particulars regarding this coast, having been so successful in his first attempt.

No information of Captain Graah's further progress has as yet, however (Sept. 1831), been received. Meanwhile it may be added, that if he succeed in gaining latitude 69° N., this whole coast will have been recently examined as far as 75° , Captain Scoresby's survey of it, in 1822, having ranged between these parallels.

III.—*Account of Operations to find Water in the Desert between Cairo and Suez.* Extracted from the Malta Government Gazette. Dated 16th March, 1831.

‘ WE have been favoured with an interesting account of some successful attempts made with great energy and perseverance by Mr. Samuel Briggs, of Alexandria, to find water in the Desert, between Suez and Cairo. This is not only an important discovery for the natives of the country, but will also prodigiously facilitate the intercourse with India by steam.

‘ The first experiments were made in the valley of Kesche, where the workmen bored, in one instance, to the depth of one hundred and sixty feet, through a fine sandstone, mixed with clay, without finding any humidity ; and in another place to the depth of fifty feet, principally through a rock composed of fragments of silex and jasper, where they met with a hard rock which broke the instruments, and the attempt was consequently relinquished on that spot. The operations were transferred to the valley of Candelli. Here water has been found in a clayey stratum, at the depth of only thirteen feet, where a well is already established, to which the Arabs come for their daily supply. Above the clay is

a bed of calcareous sandstone, five feet thick, through which the water filters; and in the stratum of clay three lateral galleries have been ingeniously struck to the extent of twelve or fourteen feet, which not only serve to collect the water, but, together with a further continuation of the well, to the total depth of twenty-one feet, form a reservoir of one thousand two hundred cubic feet of water. The whole is to be lined with stone and mortar, which will render it a work of perfect art; and what is most important is, that the water being found so near the surface, neither the labour of camels nor of machinery will be required to draw it.

‘Two other wells have been commenced in the same valley, with the same prospect of success. It is believed that, as the spot is only an hour or an hour and a half’s journey from the great chain of mountains which stretches across the Desert from the Nile to the Red Sea, the waters have there their source.

‘This enterprise has been projected by, and carried into execution at the sole expense of, Mr. Briggs. He has in his employ an able mineralogist, Mr. Albert Gensberg (a Swiss, we believe), who is still continuing his researches, and is confident of finding water, and establishing wells, at other parts of the route. The practical artificers are two Englishmen, named Hancock and Wood. The place of their labours will probably soon become stations, or villages, where men and animals will not only be supplied with water, but with all other necessities in their painful journeyings; and the names of the projector and executors of this work will be remembered with gratitude by all future travellers in this hitherto sterile desert.

‘Above all, it is hoped that the enlightened ruler of Egypt will appreciate the merits of Mr. Briggs, whose success will facilitate the commerce and promote the prosperity of that country.’

To the above may be also subjoined the following extract of a letter from Mr. Briggs himself to the Earl of Munster, who has communicated it to the Royal Geographical Society:—

‘Alexandria, June 13, 1831.

‘My attempts to discover water in the Desert between Cairo and Suez have been crowned with success; and I hope all future travellers to and from India will feel the benefit of it, as well as the pilgrims to Mecca.

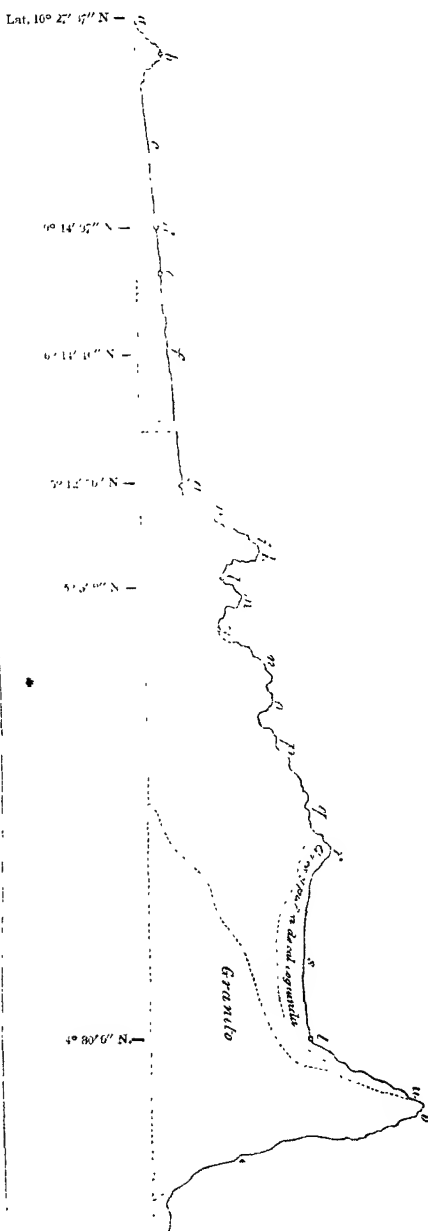
‘I have had two English borers at work during a year and a half at my expense; and *I mean to persevere till I have found water also on the other line of communication*, known to you between Cosseir and Thebes, or Kenné.

‘Ibrahim Pasha gives me every assistance in guards, tools, masons, &c., wherever sweet water is found; but the Hadgi know it is to the English they are indebted for this boon.’

IV.—Section of South America, from Cartagena to Bogota; a Spanish MS. found among Mr. Lloyd's Papers, (p. 69.) Authority unknown.

Toesna* sobre el
Nivel de la Mar

a Cartagena	0
b Turbaco	163
c Maogda	
d Mompox	147
e Morales	173
f Angostura	230
g Honda	291
h Cruces	
i Salto del Fraile	777
k Sierra del Sarjento	860
l Valle de Guaduas	648
m Alto del Frigo	679
n Valle de Villeta	580
n' Mave	800
o El Guayabal	902
p Alto de Gascos	932
q El Asseradero	1298
r Alto del Roble	1487
s Llano de Bogota	1340
t Bogota	1370
u Guadalupe	1707
v Chingara	2200



* 53 64 Toesna=160 English yards

V.—*Reef in the Pacific.*

‘ A DANGEROUS reef has been discovered in the Pacific Ocean, among the Caroline Islands, the N.E. extremity of which is in latitude $7^{\circ} 36' N.$, and longitude $155^{\circ} 18' E.$ It was found to lie in a N.E. and S.W. direction, and is so extensive, that the whole of it could not be seen from the N.E. extremity. It is about fourteen miles in a W.S. W. direction from Island Borde-laise, discovered in 1826.’

The discovery is due to the ship Larkins, W. Campbell, master; and, as here given, is extracted from her log, bearing date 23d February, 1830.

VI.—*Private Letter from Governor Stirling (Swan River Settlement) to Mr. Barrow.*

‘ Western Australia, March 13, 1831.

‘ MY DEAR SIR,—By a ship which arrived here a few days since, I had the satisfaction to receive your very agreeable notes, dated June and July last, in which I observe the expression of that kind interest which you have always taken in the welfare and establishment of this settlement. I shall be truly glad to send you such a detailed account of its statistics as you seem to wish, and I would forward it by this opportunity, if it were not necessary to wait for the completion of a general map of the territory, which is now about to be begun, as well as for a further account of the weather, as registered during last year at King George’s Sound and Garden Island. As soon as all the matters relating to a full and accurate description of this country can be brought into arrangement, I shall beg your acceptance of it.

‘ Through good report and evil report we have worked our way nearly to the conclusion of the second year, and I am proud in saying, that our prospects are brighter and better assured than ever. Since I last wrote to you, we have been frequently on the point of failing, from causes which I suppose are always to be found in operation in similar enterprises. It was my business to counteract these by further explorations of the country, of which the general result has been that the future prosperity of the settlement is now a point which no one is foolish enough to doubt. To give you an idea of our progress in discoveries, I shall briefly allude to them in the order in which they were made. Two attempts to get beyond the mountains were unsuccessful; I therefore took to the sea-coast during the wet and dry season.

‘ At Port Leschenault, in March, we found some good land; but before it could be occupied by settlers, I learnt that a good

station existed near to Cape Leuwen. In May I proceeded there, and formed a small settlement in a beautiful and fertile situation, three miles to the eastward of the Cape in Flinders' "Dangerous Bight," where now, however, there is no danger. About one hundred persons make it a very contented and prosperous little place, where ships may obtain excellent *water, wood, and vegetables*, at a few minutes' notice.

'In August, the third in order of the attempts to get beyond the hills was found to be successful. A young gentleman of the 63d regiment, accompanied by Mr. Beachman, an excellent practical farmer, penetrated to the farther side of the mountains, and found that the almost continuous range from north to south, which they form, is about thirty-six miles broad. Beyond this range, to the east, there is an undulating variety of generally fair land. The vallies, or plains, between the hills with which it is studded, are always good, and covered with grass, and the soil, though variable, presents a proportion of good land to the extent of one-third of the first quality. The travellers were prevented from going farther to the east than a few miles into this country, by a river flowing to the north, which at the time was rolling down an impetuous flood, caused by the rains of the season. After proceeding twenty miles up to the south on its banks, they returned to Perth with the agreeable news.

'In October, taking Mr. Dale, the discoverer of the above-mentioned country, with me, and several practical farmers, I proceeded across the mountains; and, having examined the country for a few days, I selected a site for a future county-town, and returned to my other tasks. I took the opportunity of sending Mr. Dale and a few others to the eastward. They penetrated to the distance of an hundred miles from the coast, directly east from Perth, and returned with a most favourable account of the country they had passed over.

'In December I again proceeded to the south coast. Our discoveries were impeded by circumstances; and, after paying a visit to the Cape Leuwen settlement, we returned by the way of King George's Sound to Perth. About the time I sailed, an expedition, which I had long been preparing, set off coastward from this to King George's Sound, under the direction of Captain Bannister. He and his party crossed the hills at the head of the Canning, after having travelled about thirty-five miles among them. He then passed for ten miles further through a country of equal proportions of good and bad land. To these forty miles succeeded the most beautiful country he had ever seen, and represented by him to be available either for pasturage or tillage. This noble district he traversed for eighty-eight or ninety miles in a S. by E. direction: at the end of which distance he came into a hilly

country, occasionally rugged, but frequently very good for stock and farming. From one of these hills they thought they saw an immense mountain to the east far above the clouds, and which the surveyor who went with him estimated at ten thousand feet high. In this hilly country they continued until they made the south coast, near to Cape Chatham; and, after enduring the extremes of hunger, they reached King George's Sound in February. The importance of these discoveries will readily appear to you. The effect upon the minds of the public here has been to remove all doubt as to the success of the colony. The river mentioned beyond the hills is, in winter, a very powerful stream, and the principal drain of that country, as far as we know. Its source and ulterior course beyond the small part of it seen by us is at present unknown, and, I may add, defies conjecture; for we know, by a recent exploration of the coast to the south as far as latitude $28^{\circ} 40'$, that no river or inlet exists on it. This point of interest shall not be allowed to remain much longer in obscurity.

'The little settlement at King George's Sound being now made over to this government, I am shipping off some of those who are not prospering here to try their fortune there. The wish of my heart at present is to get a bush road made over to that place, passing through Bannister's fine tract, and also the possession of a few coasting vessels to keep up communication with the little settlement on the coast.

'P.S. We are just about establishing a botanical garden at Perth, in which it may be hoped that, besides collecting and arranging the plants of the country, experiments may be made as to acclimating foreign productions.'

VII.—*Union of the African Association with the Royal Geographical Society of London.* Extracted from the Minutes of Council of the latter body, dated July 23, 1831.

'At a meeting of Council held this day, a communication was read from the Secretary of the African Association, intimating that the Members of that Society were willing to make over the balance of its funds in their hands to the Royal Geographical Society, and thus unite the two Societies, on condition that such of their number as were not already Members of the Royal Geographical Society, be received as such, without form of ballot, on paying the usual composition for entrance money and annual payments. On which it was unanimously resolved by the Council that this proposal be agreed to: that the following five Members of the African Association, viz. Lord Clive, Henry Banks, Esq., Charles Hoare, Esq., H. H. Hoare, Esq., and John Motteux,

Esq., be accordingly admitted forthwith to all the privileges of Members of the Royal Geographical Society, they not being already such, on their making payment as above; and that this act of Council be communicated to the Society at its first ordinary meeting, in November next, for its sanction and approval.'

VIII.—*Account of the Volcanic Island lately thrown up between Sicily and Pantellaria.* Extracted from Reports made by the British Cruizers to Admiral the Hon. Sir Henry Hotham, K.C.B.; and communicated by John Barrow, Esq., F.R.S. With a Plate.

THE Neapolitan schooner, *Psyche*, appears first to have discovered smoke on the water where the island is now situated on the 12th of July; and from the 13th to the 16th, this continued in three distinct columns, but without fire, as far as seen from a Sardinian vessel becalmed in the neighbourhood. On the 17th, the master of the brig *Adelaide*, from London, distinguished fire also; and it is probable that at this period, for the first time, the land rose to the surface. On the following day, as will be seen by the annexed letter, it had already attained considerable dimensions:—

Report of Commander C. H. Swinburne, of his Majesty's Ship Rapid, to Vice-Admiral the Hon. Sir Henry Hotham, K.C.B.

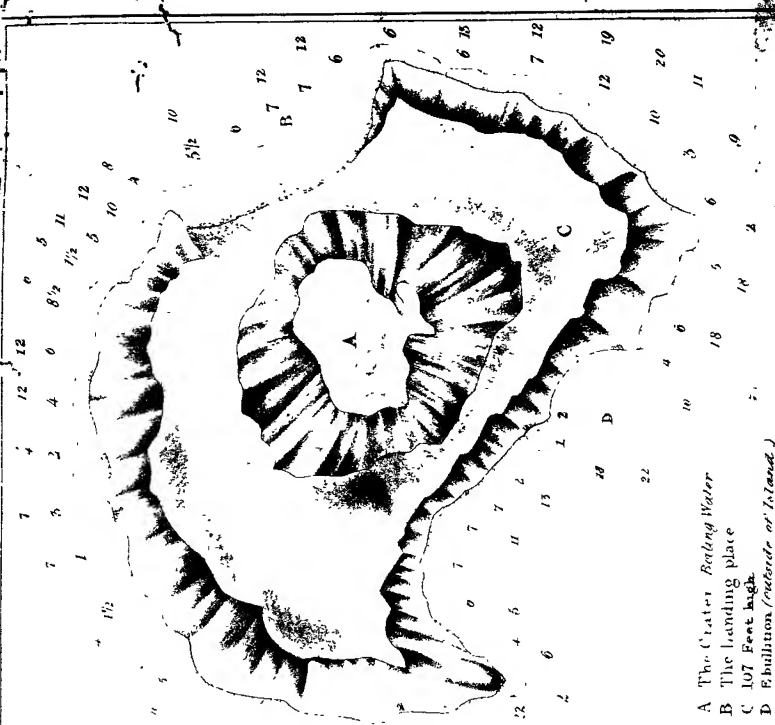
'His Majesty's Sloop *Rapid*, at Malta, July 22, 1831.

'SIR,—I have the honour to inform you that on the 18th of July, 1831, at 4 P. M., the town of Marsala bearing by compass E. half N. 9 miles, I observed from on board his Majesty's sloop *Rapid*, under my command, a high irregular column of very white smoke or steam, bearing S. by E. I steered for it, and continued to do so till 8, 15, P. M., when having gone about thirty miles by the reckoning, I saw flashes of brilliant light mingled with the smoke, which was still distinctly visible by the light of the moon.

'In a few minutes the whole column became black and larger: almost immediately afterwards several successive eruptions of lurid fire rose up amidst the smoke: they subsided, and the column then became gradually white again. As we seemed to near it fast, I shortened sail, and hove to till day-light, that I might ascertain its nature and exact position. During the night the changes from white to black, with flashes and the eruptions of fire, continued at irregular intervals, varying from half an hour to an hour. At daylight I again steered towards it, and about 5 A. M., when the smoke had for a moment cleared away at the base, I saw



Sketch of the appearance of Graham Island on the 18th of July 1831 when
 seen and by H.M.S. Rapid — Town of Seacra in Sicily N.E. $\frac{1}{2}$ N 40 miles —
 1st mile of Puntellaria S.W. by W 33 miles — true bearings



a small hillock, of a dark colour, a few feet above the sea. This was soon hidden again, and was only visible through the smoke at the intervals between the more violent eruptions.

‘The volcano was in a constant state of activity, and appeared to be discharging dust and stones with vast columns of steam. At 7, 30, the rushing noise of the eruptions was heard. At 9, being distant from it about two miles, and the water being much discoloured with dark objects at the surface in various places, I hove to, and went in a boat to sound round and examine it. I rowed towards it, keeping on the weather side and sounding, but got no bottom till within twenty yards of the western side, where I had 18 fathoms soft bottom; this was the only sounding obtained, except from the brig, one mile true north from the centre of the island, where the depth was 130 fathoms soft dark brown mud. The crater (for it was now evident that such was its form) seemed to be composed of fine cinders, and mud of a dark brown colour; within it was to be seen, in the intervals between the eruptions, a mixture of muddy water, steam, and cinders, dashing up and down, and occasionally running into the sea over the edge of the crater, which I found, on rowing round, to be broken down to the level of the sea on the W.S.W. side, for the space of ten or twelve yards. Here I obtained a better view of the interior, which appeared to be filled with muddy water violently agitated, from which showers of hot stones or cinders were constantly shooting up a few yards, and falling into it again, but the great quantity of steam that constantly rose from it prevented my seeing the whole crater.

‘A considerable stream of muddy water flowed outward through the opening, and, mingling with that of the sea, caused the discoloration that had been observed before. I could not approach near enough to observe its temperature, but that of the sea, within ten or twelve yards of it, was only one degree higher than the average, and to the leeward of the island, in the direction of the current (which ran to the eastward), no difference could be perceived, even where the water was most discoloured; however, as a “mirage” played above it near its source, it was probably hot there. The dark objects on the surface of the sea proved to be patches of small floating cinders. The island, or crater, appeared to be seventy or eighty yards in its external diameter, and the lip as thin as it could be consistent with its height, which might be twenty feet above the sea in the highest, and six feet in the lowest part, leaving the rest for the diameter of the area within. These details could only be observed in the intervals between the great eruptions, some of which I witnessed from the boat. No words can describe their sublime grandeur; their progress was generally as follows:—After the volcano had emitted for some

time its usual quantities of white steam, suddenly the whole aperture was filled with an enormous mass of hot cinders and dust, rushing upwards to the height of some hundred feet with a loud roaring noise, then falling into the sea on all sides with a still louder noise, arising in part, perhaps, from the formation of prodigious quantities of steam, which instantly took place. This steam was at first of a brown colour, having embodied a great deal of the dust; as it rose it gradually recovered its pure white colour, depositing the dust in the shape of a shower of muddy rain. While this was being accomplished, renewed eruptions of hot cinders and dust were quickly succeeding each other; while forked lightning, accompanied by rattling thunder, darted about in all directions within the column, now darkened with dust, and greatly increased in volume, and distorted by sudden gusts and whirlwinds. The latter were most frequent on the lee side, where they often made imperfect water-spouts of curious shapes. On one occasion some of the steam reached the boat: it smelt a little of sulphur, and the mud it left became a gritty sparkling dark brown powder when dry. None of the stones or cinders thrown out appeared more than half a foot in diameter, and most of them much smaller.

‘From the time when the volcano was first seen, till after I left it, the barometer did not fall or rise; the sympiesometer underwent frequent but not important changes, and the temperature of the sea did not bespeak any unusual influence.’

This was its state on the 18th July. On the 22d it was again reported on by Commander Smith, of the *Philomel*, another of his Majesty's ships, who says, ‘the N.W. part is the highest, being about 80 feet above the level of the sea, and becoming lower towards the southern extremity; the S.E. side is broken down even with the water, which keeps rushing into the crater with great noise; whence rises in turn an immense volume of white vapour, curling and spreading to an extraordinary height, intermixed, in rapid succession, with magnificent eruptions of cinders and lava thrown to the height of from four and five hundred to a thousand feet, forking and branching out as they ascend, and then pouring down with a noise like thunder, making the water a sheet of foam for a considerable distance around it. During the night the eruptions were not remarkable for a very great quantity of fire, though a constant shooting of small columns was visible, with occasional flashes of sheet lightning; when near to it to leeward, the sulphur was nearly suffocating the crews of the boats.

‘The Volcano appears to be composed almost entirely of cinders, with a sprinkling of lava, of an oblong shape, about three-quarters of a mile in circumference, and from the soundings has as yet a very small base.’

Captain Senhouse of the *St. Vincent*, Sir Henry Hotham's flag-ship, is our last informant, who, having been detached in the *Hind* cutter to ascertain the exact position of the island, effected a landing on it on the 3d August, hoisted the British ensign, and called it *Graham Island*. His description of the eruptions differs little from those already quoted:—his account of landing, with estimate of height and other dimensions, we sub-join nearly in his own words:—

Seizing a favourable moment, we gave way with our oars. Our distance was rather greater than we could have wished, but we proceeded as quickly as the sea would allow. As we approached, some occasional jets were thrown up, but of little consequence; and a current was discovered running to the westward, and setting us farther to the right than we desired. Within twenty yards of the shore, the water appeared shoal, and the sea broke; but as there was no appearance of surf on the beach, we kept steadily on till the boat struck the ground. The *Union Jack* was then planted, such observations were made as the pressure of circumstances, and the imminent danger of a fresh eruption every moment, would admit of; a bucket-full of the materials of which the island seemed chiefly composed was collected; and we re-embarked.

‘The form of the crater is nearly a perfect circle, and complete along its whole circumference, excepting for about two hundred and fifty yards on the S.E. side, which are broken and low, not apparently above three feet high. The height of the highest part, I supposed by the eye to be about one hundred and sixty feet; a rough computation afterwards made it one hundred and eighty. The outer diameter is, I think, almost six hundred and forty yards, and the inner about four hundred. The whole circuit of the island I conceive to be from a mile and a quarter to a mile and one-third.

‘The fragments brought away are compact and heavy, and the whole surface of the island is dense, and perfectly hard under the feet. No variety of stones were procured, nor any lava; neither did I see any jets or streams of lava while on the island. All the fragments were very hot when collected; and I thought the temperature of the sea close to the shore somewhat higher than farther out, although of this I was not very certain. The latitude of the island is 37° 11' N. Longitude 12° 44' East of Greenwich.’

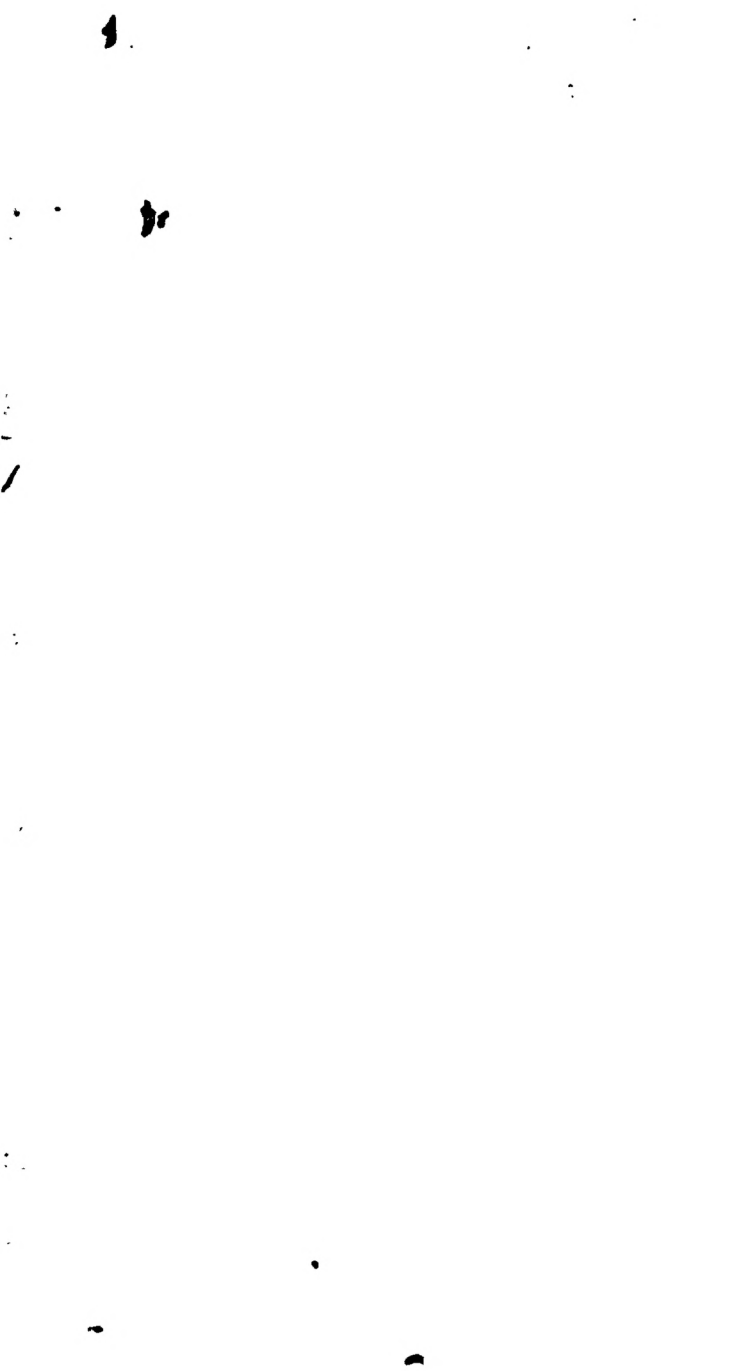
We have been somewhat more minute in our extracts from these documents than the strict value of the information they contain warrants: because, by the latest accounts the island is still increasing in extent, and consequently none of the above descriptions are now accurate. . But something is due to the interest of the

phenomenon. It is remarkable that as far back as the 28th June, Admiral Sir Pulteney Malcolm, on his return home, and passing nearly over the present position of this volcano, experienced several severe shocks, which were attributed to earthquake. And two other facts are still more worthy of notice. A tradition exists at Malta, that a volcano existed in the same spot about the commencement of the last century; and one of the officers of the St. Vincent has an old chart of the Mediterranean, published by G. Faden, which lays down a shoal with only four fathoms on it, and called Larmour's Breakers, within a mile of the same latitude and longitude.

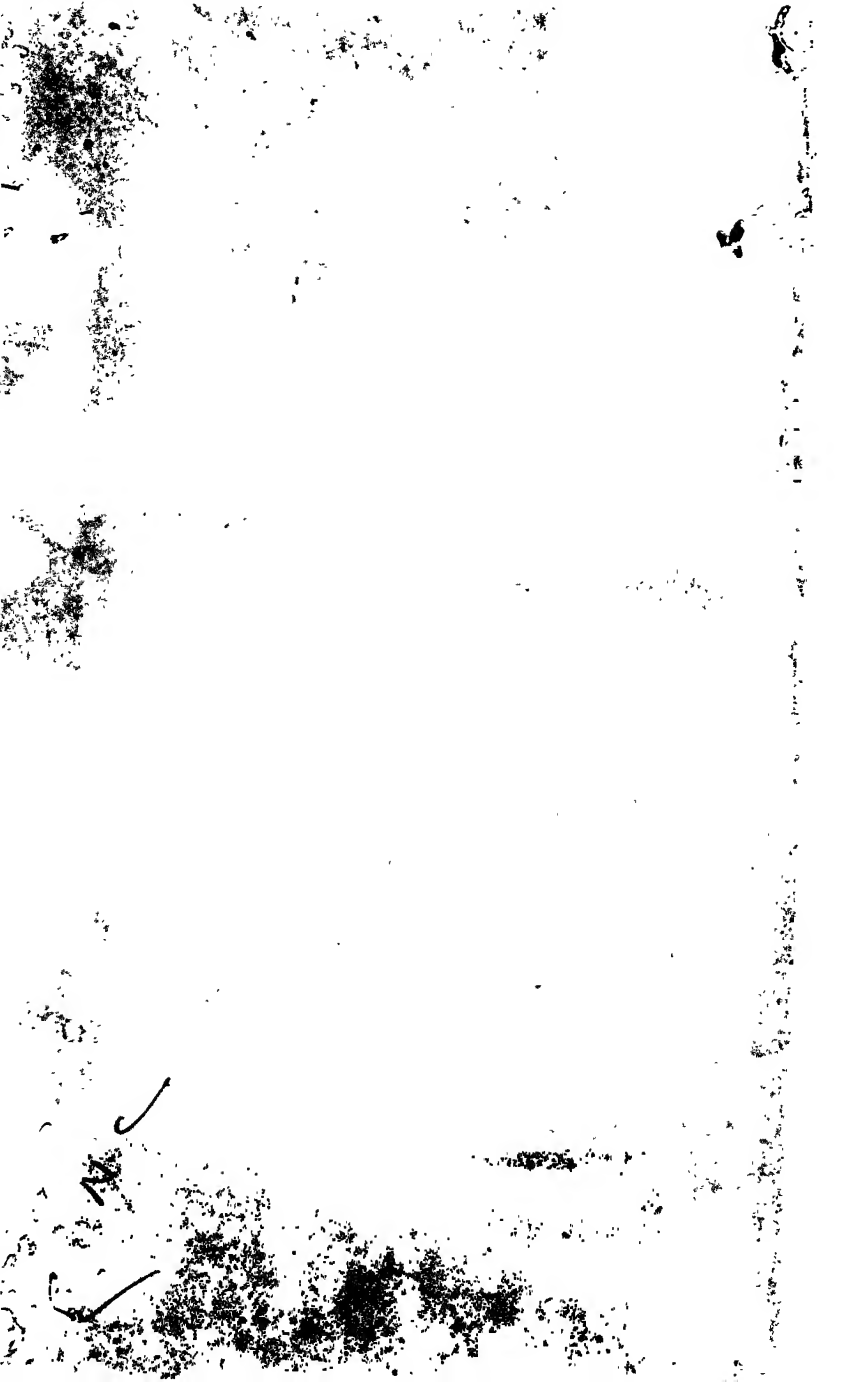
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